

30,000 technology and science places vacant

by David Hencke

A nationwide effort to fill the 30,000 empty science and technology places in Britain's universities and polytechnics was demanded by Mr Keith Durrands, rector of Huddersfield Polytechnic, at the launching of Project—Engineers and Technologists for Tomorrow (PETT) at the Confederation of British Industry last week.

Mr Durrands warned that the country was desperately short of engineers and technologists. He suggested that a new five year sandwich degree, adoption of the French system of *Grandes Ecoles* and a higher grant could attract more science and technology students.

He also suggested more collaboration between polytechnics and schools on joint projects and a greater interchange by the civil service and industry.

Mr Durrands was highly critical of the type of higher education engineering courses available in universities. "Our university courses are designed in the main to produce excellent analysts who have an important role to play provided they are a part of a team which contains equally competent synthesizers—

men and women who can innovate and create.

"Although the highly analytical courses are very demanding, and indeed do produce scholars, at the same time they do perhaps inhibit many students and prevent them from developing their creative talents."

Mr Durrands said polytechnic courses tended to be more relevant than university courses and in engineering and technology this implied that there should be more of a balance between university and polytechnic students.

"Currently, the balance is very much in favour of the universities. Perhaps this is why the balance of graduates is so heavily weighted towards research and development. Perhaps, too, this is why our innovation and market performance do not always match our inventiveness."

Professor John Coates, chairman of the Council of Engineering Institutions, warned that the current position in schools and universities was "really frightening".

"We have barely enough engineers and technologists to maintain our economy at the present level and the number opting for science and mathematics in the schools is dwindling rapidly."

Place your call to OU 'phone tuition

by Jane Feinmann

Teleconferencing, a post office service whereby several people can take part in a telephone conversation, is likely to add a new dimension to tutorial teaching in the Open University over the next few years.

The Bell Telephone Company in the United States originally pioneered the system, along with numerous audio-visual sophisticated, so that executives in national and international corporations could cut down on business trips, a seminar at University College London on telephone conferencing heard last Friday.

Mr Ben Turok, a senior counsellor in the OU, said that telephone tutorials are cheap and from the students' point of view a highly acceptable solution to what has become an increasing problem in the OU. As students graduate to more advanced and varied courses they are being asked to travel increased distances to attend tutorials. The problem is exacerbated where students live in remote or inaccessible places.

In London over 100 students, divided into 20 groups are now having fortnightly telephone tutorials on STD calls.

The procedure is relatively straightforward. The tutor identifies the student who needs help at home and he contacts the regional head office. There the "disadvantaged" students are divided into groups of five or six and assigned a tutor.

The Post Office is informed in advance of the planned tutorials and the student is told by the OU of the time and date of his tutorial. All being well, his telephone rings at the appointed time, and the operator asks him to hold for his conference call.

Mr Turok says the beauty of the system is that it is cheap. STD tutorials in London cost £1 per hour—£3 in Scotland because trunk calls are used.

There was considerable resistance within the OU to the innovation. It was believed that the small face-to-face seminar was the best way of teaching and should be retained at whatever cost. Mr Turok agrees but says that reality has to be faced. There was also considerable scepticism as to whether the new system would work, both in human and technological terms.

He admits the critics have a point. The device most commonly used was not designed specifically for tutorials—the volume is inadequate, often resulting in disastrously clipped speech.

In fact, most students have reacted well to the new system. If only because they are highly motivated to do so. "Students who are prepared to adapt to TV lessons to get a degree are also likely to be prepared to adapt to telephone tutorials," Mr Turok says.

A serious deficiency is the lack of a visual component. The OU has already designed a datapad which could be supplied to students throughout the country. Research is currently being carried out to develop a practical and inexpensive version which, it is hoped, will be available in about two years.



On the 'phone for tutorials.

Capitalize on assets says Aston v-c

by Alan Cane

With Britain short of money it made no sense to establish expensive new institutions when universities such as Aston in Birmingham could do the job at minimal capital cost, says the development of existing activities, Dr J. A. Pope, Aston's vice-chancellor wrote in his annual report, published last week.

He emphasized that demand for student places at Aston was showing no decline, and in fact the university might exceed the target set by the University Grants Committee.

He wrote: "The applications received to date are some 20 per cent up on the number received at the corresponding date last year. In many cases the increase in student numbers achieved by the university is against the national trend, especially in the field of engineering. If the student numbers continue to increase at this rate, then we shall exceed by some 500 the student target numbers for 1976/77 provided for by the UGC. The total student numbers will then be 4,500 full-time equivalents."

Dr Pope says he believes the university should remain for three to five years with a student population of 5,000 to allow consolidation. He warns that the growth of the university would be seriously distorted if numbers were kept below this figure.

Dr Pope, writing before the 1975-76 university grants figure was announced earlier this year, said that the university had no cash reserves to offset a possible deficit but he had large overdrafts from two banks used to finance residential projects.

He went on to say: "With the ever increasing costs of university overheads, the only way that the university can possibly remain economically solvent is by increasing student numbers in the following quinquennium, provided the university receives a proportionate increase in income."



Tourist trap

Six weeks ago we were talking ourselves into a new ice age, and the Gulf Stream was taking a right turn. Now Cambridge lies dazed in the sun, mulling about the parched grass. It is not quite as peaceful as it seems, though, for bursars have been hard hit by inflation, and are busy nursing the conference trade to help make ends meet. Every few days a different crowd of faces comes drifting around, with labels under them.

What are they all talking about, and where's the money coming from? It is said there is some consumer resistance: I read of a horrified businessman complaining that in his experience some of the colleges at Oxford and Cambridge were "absolutely medieval". To protect such tender susceptibilities the conferences are usually put in the new

blocks, which have the twin advantages of looking like everywhere else and adequate sanitation.

But here's the chief feeling of being under observation again. This is a ground-floor room in a tourist trap, and inquisitive eyes are peering through the window. Sometimes parties of people walk into the room and look around wonderingly. It's like being in a zoo.

Most colleges reckon they are doing quite enough by remaining open free of charge, but I feel sorry for the tourists and wish we did more to help them. They look so hard, and see so little, for the local fairs are so secretive.

Misquotation

I've just read something about the allegedly fixed social order of the past, which quoted the Catechism on

of its creatures as the system draws me in. Today I had a letter from a respected academic colleague evading a moral issue by quoting regulations and established procedures.

My distaste was more than doubled by the quick realization that I had just written a similarly evasive letter of my own. Is this the evil in education that I sense it to be or am I being oversensitive or even sanctimonious?

Every time a waitress or a shop assistant tells me that "we cannot serve this with that" when she means "I will not serve this with that" I feel a sense of outrage at her, albeit unconscious, dishonesty and evasion of responsibility. That those around me accept this quietly I find even more disturbing.

One of my favourite bits of law is that under the Race Relations Act it is no defence to hide behind the racial prejudice of others. The Nuremberg trials established the principle that obedience to orders was no defence against criminal charges and revealed some of the worst war criminals as timid pen-pushers merely signing orders in accordance with established procedures and routine instructions.

I wish this principle could be extended to the petty criminality and to many other aspects of foolish and stupid behaviour of jacks in office. How much cleaner and pleasanter our lives would be if post office managers could be held personally accountable for the follies they commit in the name of their faceless masters. What a joy, and indeed what a shock, it would be to find the general manager of London Airport proudly parading in the departure lounge because it was easy to seal off and control with a couple of machine guns, or a canister of gas, I was amused by his wit.

When one of this country's leading authorities on civil disorder commented to me a few years ago that the courtyard of the University of Lancaster was nicely designed because it was easy to seal off and control with a couple of machine guns, or a canister of gas, I was amused by his wit.

Quite recently his remark has been haunting me. Fantasies? Certainly. But remote and incredible fantasies have during this century only too often become nightmare realities. When I read a report of

Don's diary

"doing my duty in that station of life into which it has pleased God to call me". Hyperactivity, misquotation is a domish folly, but I surely meet that one three or four times a year.

The Catechism says, "that state of life into which it shall please God to call me", for the Church of England always believed in social mobility. Hence all those scholars: meritoristic, maybe, but scarcely feudal.

Why the invariable misquotation? As in the case of the regiment of women, people get it wrong for a reason, surely?

some effective way of thinking, like Descartes meditating in bed (and even that only briefly, or so he claims).

Meanwhile, off to water the seedlings and wait for ideas. Come to think of it, didn't Russell use sleep to solve his problems? No, I've tried that. Russell programmed his brain, went off to sleep, and woke with the answer. I mentally set out the question and then merely failed to sleep. And now there are watering restrictions.

Royal glimpse

A few years ago a Royal person visited a college here, and the idea was that she should be given some informal glimpses of what people actually did to earn their bread. It was easy enough to arrange for a scientist to seem to be doing something useful and scientific, but what about the arts? Some unfortunate individual was persuaded to put on cap and gown, and sit at a desk appearing to read *Domus*. That is what we call "research", *ma'am*.

As public debate in this country appears to be getting more and more confined to discussing methods of lubricating and speeding up the mighty treadmill of production and consumption, it gets harder and harder to justify ourselves.

Leibniz. Making maps by triangulation. You can't make a good map from one point of view, but if you coordinate measurements made from several points of view, hey presto! — "objectivity", out of a network of relations. Appearance and reality, my world and our world.

If the world is a system of points of view, is God still needed to ordain the whole, as Berkeley and Leibniz thought? And what have we all done in all this: swapped the God's-eye view of the world for the collective public view of society? What makes the latter more "objective" than the former?

It's not coming out, and I shall be dreaming (with interruptions) for a day or two yet. I wish I knew

the ring-leaders of student militancy, for good reason, that the student will not demand less by admitting this to me, or so him. We are entitled to know only that the machine has worked according to rules, as if we didn't know that. Hard cases make bad law, but bad law also makes hard cases.

It may be that men of some humanity did sympathetically consider his case, but the machine will not demand less by admitting this to me, or so him. We are entitled to know only that the machine has worked according to rules, as if we didn't know that. Hard cases make bad law, but bad law also makes hard cases.

Noel Annan is completely out of touch if he thinks that serious advocating a return to traditional academic relationships will serve any useful purpose. He should have learnt from his excursion to Essex that this can only aggravate the situation.

The old are excessively impressed by the precociousness of the young. They fail to perceive and much less to comprehend the idealism, the insecurity and the despair that motivates many of our hard-faced sons and daughters. Higher education and indeed our whole community, desperately needs leaders of mature personality who genuinely like young people and who will strive to share their hopes, their problems and their agonies.

There is no substitute for sheer humanity, sentimental though it may sound. By this I mean an awareness of and a concern for what is happening to people. It is always possible to score a point in a conference on higher education by enumerating that nobody has mentioned students' Within the hierarchies of higher education preoccupation with "bigger" issues than the experience of students is only too easy. A useful discipline in any academic committee is to keep asking what effect our decisions will have on what actually happens to students.

And surely it is never sufficient, when a decision is challenged to reply that all the regulations have been satisfied and all the rules obeyed.

Have a letter in front of me that

a euphemism for the pangs of conscience which many people still feel when instructed to hurt or kill their fellow men. Harmless enough in most people, this weakness is a serious handicap to soldiers and secret service agents in their work, so techniques are being developed and applied to reduce it. Will anybody connect the two stories?

Perhaps I am getting back to my dreaming again. In a world in which Society has taken the place of God, and "social responsibility" the place of conscience, then the group must be objectively right and the individual must be wrong.

Don't we all increasingly accept the propriety of manipulation? Every time we reject "moralising" and "preaching", and ask instead for causal inquiry into techniques for solving a social problem, we are taking this process a stage further.

Every issue that comes up, from wife-beating to football hooliganism, from racism to obesity, is now days handled this way. We're on our knees, begging to be manipulated, provided only that we are manipulated in the directions most of us think we should be manipulated. After all, this is the free world, isn't it? We're sturdy democrats, aren't we?

Theology is...

A pile of letters, do this, in that. Then a day conference for sixth-formers, thinking about reading theology. Touting for custom, you might think, but in fact we are not short on numbers. Growing, if anything, with a surprising number of agnostics reading the subject, as well as a large body of strong conservatives. These latter use radicals of a sort rare, I think, in other faculties, and their often vocal criticism of what they hear poses some really problems for lecturers and supervisors.

Meanwhile, the young people want to know what theology is. We try to tell them. Heaven knows what they make of it all. Is it about everything, or nothing? But they keep coming, we are still in business, and I say it's about everything.

Don Cupitt

The author is Dean of Emmanuel College, Cambridge, and a lecturer in divinity.

decision to fail a student and adds, for good reason, that the student will not demand less by admitting this to me, or so him. We are entitled to know only that the machine has worked according to rules, as if we didn't know that. Hard cases make bad law, but bad law also makes hard cases.

A young man for whom I bear some professional responsibility has had his future blighted by a mischance which has plunged him between the gears of an academic examining machine. When I enquired about the prospects of a humane consideration of his situation, I was first damned for my impertinence and then formally told that the machine had worked smoothly to crush him.

It may be that men of some humanity did sympathetically consider his case, but the machine will not demand less by admitting this to me, or so him. We are entitled to know only that the machine has worked according to rules, as if we didn't know that. Hard cases make bad law, but bad law also makes hard cases.

I am not infrequently criticized for advocating the abandonment of established academic connections and procedures by the colleges of education. I have been accused of carelessly discounting the essential humanity of the colleges in engaging them in the alleged inhumanity of the technical college world.

But the more I see of the mindless formalism of some of the well entrenched academic authorities under which the colleges have been compelled to work in the past the better I understand their willingness to break away. If we cannot guarantee them something more humane than this I hope we will have the decency to slack away.

To Grimsd last weekend made a timely appeal for universities to re-examine what they are about and suggested that in consequence of this one or two might close down. A moderate suggestion, as better liberal. If colleges and universities are not free, and therefore human, in their concerns, we must as well

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End of the independent road for Internavex?

Internavex, one of the largest and most successful international audio-visual exhibitions and conferences, is dying according to rumours circulating among exhibitors.

In the edgy atmosphere of Internavex 1975, held at Olympia this month, exhibitors admitted that they had lost confidence in the event.

Next year it will be a completely different event which will not suit our purposes, they said. However, some believe it should be held biennially.

These gloomy predictions have emerged mainly because next year Internavex is giving up its independence to become only one of eight exhibitions and five conferences held under the aegis of Cuxton 76, a festival to mark the quinquennial of the first book printed in Britain and to present a complete survey of the communications world.

Another important reason was the amount of empty space at this year's exhibition, the absence of large companies like Bell and Howell and the fact that the last year, no educational institutions were represented. In 1974 this had proved a strong attraction and both visitors and exhibitors this year were disappointed by their absence.

One other drawback was the separation of the conference from the exhibition. This year it was held at Whitecliffs College, Putney, and in spite of free transport between the college and Olympia, exhibitors felt that many delegates either did not come to the exhibition or spent very little time there.

Companies who sell solely to the education sector have been particularly affected. Mr. Fiedel of R. W. Fiedel and Co. Ltd, who manufacture language laboratories, said they had lost potential customers.

As far as my company is concerned we will not attend Internavex next year, and I have put it down in writing to the organizers, Mr. Fiedel added. "It would be a

dead loss to exhibit, since it is mainly a printing exhibition; we can get more business and generate more interest by sending staff round the country."

He said that several of his competitors agreed with him, especially since it would be so much more expensive next year: he estimated costs would rise by 100 per cent.

However, the sponsors of Internavex, the National Committee for Audio-Visual Aids in Education, a body which disseminates information, advice and training in audio-visual matters to schools, colleges, polytechnics and universities, does not appear too worried by these prospects.

"If this is what the exhibitors are saying, then they have got it all wrong," Mr. Marchant, the director of NCAVAE pointed out. "As far as I am concerned Internavex next year will be a much bigger event." Mr. Marchant will be president of Cuxton 76.

"I may consider holding the exhibition every two years, but I am not being pressurized into this; I have made no decision as yet."

Brintex Exhibitions Ltd, employed by NCAVAE to organize the exhibition, said that the empty space was a reflection of hard economic times and not the death knell of Internavex. It is true that the drop in attendance figures has been small. Last year 11,687 attended. The available figure for 1975 is 10,905.

However, Mr. John Northover, who organized last year's exhibition, said that he now manages a director of Avelay/Cybervox, one of the exhibitors, confirmed that there was a general feeling among exhibitors that Internavex would not continue to exist in its present form.

Discussing the future of exhibi-

tions generally Mr. Northover said that all were declining in size and that it was foolish for any organizers to think that they could be bypassed by expenditure cuts. Current severe curbs in education expenditure, for example, are an added reason for some not to bother about attending exhibitions. For a successful exhibition, at least six big companies had to be attracted and then all the smaller ones would follow, a point echoed by Gordon Audio-Visual, who had a very successful exhibition.

One big manufacturer unlikely to be exhibiting next year is Sony. "It is a great pity because we found the quality of the enquiries at the exhibition much higher than in other years, but we do not see the point of a video manufacturer exhibiting at a printing exhibition and therefore we are looking for a video fair to show at in 1976," a spokesman said.

Among exhibitors who favoured a biennial exhibition were Elite Optics Ltd, although business at this exhibition had been excellent.

However, delegates at the three-day residential conference struck a far more cheerful note. On the whole they did not think Internavex would die but they thought it should be held every two years. And although it was difficult to get to the exhibition they had found the conference worthwhile.

One lecture, on "Educational technology and the developing world," pointed out that industry and education could profitably adopt innovations emerging in the Third World. One example was the use of functional literacy methods to combat adult illiteracy; another, the nomadic education scheme.

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Discussing the future of exhibi-

'If there must be grading let the stress be spread throughout the year'

A great deal has been written in recent years about changes in assessment although not to much avail. Working after working party, generation after generation of students have retraced each other's steps over the now well-trodden ground. But few of the debates have led to changes in conventional practice or in the assumptions which underlie it.

A number of universities now allow a proportion of course work to be taken into account in finals, but this almost invariably counts for less than half the total marks. It is usually justified as a safety net for examinations that are not so particular student justice.

Most of the curriculum changes which the Nuffield Higher Education Group have encountered retain the three-hour written examination as the central method of assessment. Some modifications to the form of examinations have been introduced: "open book" papers, extension of the three-hour time limit; foreknowledge of the questions. And in a number of cases, the "great race" is now run in instalments by shifting some of the hurdles to the second year of the course. However, few institutions have moved far from using the examination as the basis for classifying their students or presenting results in traditional forms.

The arguments for continuing any long tradition are tempting and powerful. The ritual and machinery are well institutionalized: the external examiners know the standard, and the administration is geared to handling the results. Examinations are set, met and annually confirmed. What is more, many a member of staff would argue it is the students themselves who really want to continue the status quo. Students sometimes confirm this view once they have successfully learnt to "play the game".

Even so, there are growing signs of dissatisfaction with the present system. The very nature of some of the more pervasive curricular innovations imposes new strains on old machinery. There are certain groups of students for whom the conventional examination now comes as an irrelevant and inappropriate jolt.

For example, students who have worked largely in small groups find that they cannot exploit the full potential of this method of learning if their efforts are judged solely on the results of conventional examinations at the end of the final year. Equally, students following independent learning programmes, with assessments built into the course at intervals, point to the absurdity of having to set all this work aside for a single "make or break" terminal exercise. The point is that examinations, while testing a whole range of skills, fail to measure the intellectual skills developed over three years at university.

One major function of assessment is to improve teaching and learning. It is certainly often overlooked and with it an opportunity to give students a means to appraise critically their own intellectual competence. On the assumption that intellectual development does not stop at graduation, forms of assessment may well have a greater practical long-term value.

There are two styles of assessment which can make a positive contribution to learning as well as meet the requirements for public accounting at the end of the course. Both involve students taking part in evaluation of their own competence. One is based on staff-student negotiation and the other on the progressive development of a sustained piece of work.

Negotiation of assessment between staff and students exemplified, for instance, in one of the environmental science courses at the University of East Anglia, shifts the emphasis to some extent away from judgement of the final product and invites discussion of teaching and learning. From the beginning, students and staff decide together what is to be assessed, how and when. This encourages tutors and students to examine the positions they hold in relation to the area of knowledge they are studying. It also reduces the "game-playing" that frequently takes place over assessment.

The second approach is characterized by the system of reworked essays in the German studies department at the University of East Anglia.

re-working of essays presented at seminars throughout the year stimulates discussion of teaching and learning and provides an opportunity for students to improve their performance on the basis of feedback from other students and tutors. Those who have worked in this system comment that the deadline stress, often the bane of examinations, is not removed but spread throughout the year. And the stress is more productive, they claim, since it encourages them to raise their own intellectual standards. The proof is the product they have at the end.

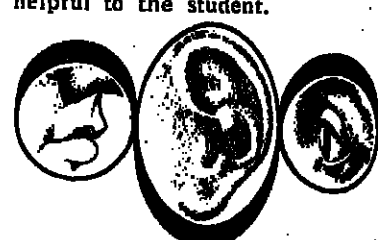
These approaches obviously have their own particular disadvantages; for example, factors of personality may prejudice judgment; results may be difficult to compare; the whole process takes up a lot of staff time. But it is argued that the subjective judgment involved in marking or grading is open to the same criticism even though it is usually assumed to be somehow more "objective", and that although the time involved is greater, the outcome is considerably more helpful to the student.

The difficulties of comparing and combining results for classification are sometimes seen as a drawback to the introduction of alternative forms of assessment. Challenges to degree classification are age-old. Without going over the debate a few simple points can be made. Present practice is often justified on the grounds of public recognition: employers know what it is, it is a tradition. The very nature of some of the more pervasive curricular innovations imposes new strains on old machinery. There are certain groups of students for whom the conventional examination now comes as an irrelevant and inappropriate jolt.

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For example, students who have worked largely in small groups find that they cannot exploit the full potential of this method of learning if their efforts are judged solely on the results of conventional examinations at the end of the final year. Equally, students following independent learning programmes, with assessments built into the course at intervals, point to the absurdity of having to set all this work aside for a single "make or break" terminal exercise. The point is that examinations, while testing a whole range of skills, fail to measure the intellectual skills developed over three years at university.

One major function of assessment is to improve teaching and learning. It is certainly often overlooked and with it an opportunity to give students a means to appraise critically their own intellectual competence. On the assumption that intellectual development does not stop at graduation, forms of assessment may well have a greater practical long-term value.

There are two styles of assessment which can make a positive contribution to learning as well as meet the requirements for public accounting at the end of the course. Both involve students taking part in evaluation of their own competence. One is based on staff-student negotiation and the other on the progressive development of a sustained piece of work.

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Mr St John-Stewas on the state of the universities

'We are unrepentantly pro-university'

At a time when Lord Crowther-Hunt on behalf of the Labour Party is suggesting policies which would destroy the freedom and autonomy of the university community, and Mr Jo Grimond, of the Liberals, is putting forward the counsel of despair of the closure of one or more of our universities, I am happy to say that the Tory Party remains unrepentantly and unreservedly pro-university.

The universities are essential to the cultural and material progress of our society. They provide us with the cultural and critical centres necessary to our advance as a nation. Like the grammar and direct grant schools, they benefit those who have never entered their doors by upholding high standards and ideals of academic excellence for the whole nation.

Lord Crowther-Hunt's proposal for manpower planning in higher education is utterly antipathetic to the ideal and to the reality of a university. The function of a university is to expand wherever possible the boundaries of knowledge and information in all fields. Not only is knowledge pursued for its own sake, but also for its practical effects.

To have subjects from universities to any other institutions in the interests of manpower planning, and to concentrate scarce resources in educational finance on everything but universities, is wrong and we reject it.

Lord Crowther-Hunt can prate about "relevance" but the truth is so often that today's relevance is tomorrow's irrelevance.

The idea of trying to attract more students into science and technical subjects with the emphasis on quantity rather than quality on the assumption that scientific training equips students better than an education in the arts or humanities, reveals a paucity of ideas and a dearth of reasoning appalling even for the Government, which is rapidly sinking its policies in the arts and educational fields, earning a reputation of being the most philistine in our long history.

Higher education in universities must continue to conserve our cultural heritage as well as to push forward the boundaries of knowledge. This is not a utopian picture of what a university should do; this is what actually happens.

Universities have never had a single function, but they have through the years carried particular responsibilities as centres of dis-

interested scholarship, for the conservation and advancement of knowledge. Further, universities transmit knowledge to the new generations through that unique combination by which teaching is conducted by the same individuals who are exploring and extending the map of human knowledge.

Within this framework research remains vital. Research for most university staff is a prerequisite for and corollary to their teaching function.

When modern knowledge is changing so quickly, teaching related to research is vital. It must be stressed that universities in the United Kingdom uniquely offer this. As a result, universities have made a major contribution to the wealth of this nation, and what we need is more of this contribution, not less.

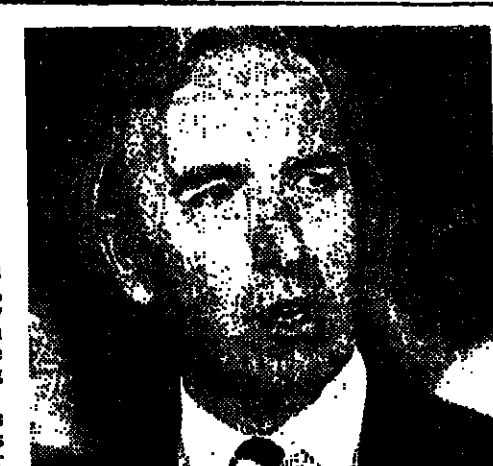
The policy of the Conservative Party on the universities is therefore clear. We cherish and esteem them as the crown of our educational system. They have served the nation well: the employment by industry and commerce of university graduates and the wide consultant function of university teachers is testimony to the fact that universities are relevant to the needs of the outside world and, indeed, are centres for advice, information and the practical application of ideas.

Our universities have given us the best first degree in the world and one that can be achieved in the shortest time. The wastage rate of students is among the lowest in the world: 9 per cent as opposed to 60 per cent in the United States and 40 per cent on the Continent. Student troubles have been publicized but they are mild compared to many other countries. Over the past decades the universities have carried through a massive expansion without any lowering of standards.

The country's economic difficulties have involved severe cuts in educational budgets, and universities have been singled out by the Labour Government for particularly harsh treatment. They are not merely being subjected to cuts; they find themselves at the wrong end of a hatchet.

The Times Educational Supplement on July 4 reported that: "Plans to cut education spending by at least £500m in the next four years are now being drawn up by officials in the Department of Education and Science."

But if the 10 per cent limit on wage rises announced by Mr Healey fails to bring inflation under control, the education service



Mr Norman St John-Stewas.

can expect an extra, short term cut of £50m this autumn."

If past experience is anything to go by, universities will have to bear the brunt of this further cut.

Already financial cuts during the last academic year have resulted in the freezing of the number of academic posts and a massive reduction in maintenance.

The last academic year of 1974-75 with its reduced finance was intended to be a single exception during the present quinquennium; now the Government is treating this year as a base year for next year instead of reverting to the original quinquennium provision. It is almost as if the Government is intent on making universities bankrupt since the money they have taken away and will take away is committed money.

It is more than finances that are being threatened. The Government is attacking the autonomy of universities.

In the black quinquennial grant system the Government has a method which has been employed to the advantage of government and universities alike and through which universities have preserved their autonomy and government has been protected from charges of interference.

The quinquennial system also provides an administrative system which allows the division of global sums between institutions on an impartial basis through the University Grants Committee. University education can be planned on a time scale appropriate to the length and nature of degree studies with this system.

The firmness of the quinquennial guarantee of income has constituted a major part of its value. However, the cuts during the present quinquennium have made it imperative that universities be assured in future of a proper system of supplementation so

that rising costs do not erode their fixed incomes.

British universities are national and not regional institutions. Their autonomy is protected by the black quinquennial grant system administered through the University Grants Committee. This must not be changed by any scheme of regional administration. Any development in means of cooperation with other institutions in this country or in the European Community should be decided by the universities themselves. The period of massive expansion of higher education is over for the moment, but the universities must have the means to do their job well. Cuts in education spending should be evenly distributed and universities should not be penalized in the interests of other higher education institutions.

The record of our universities is an excellent one and must not be allowed to be destroyed. University teachers in the United Kingdom have fulfilled their role with diligence and dedication. It is a poor reward for their achievements to discriminate against them so that a lecturer in a university is now paid anything between £2,000 and £3,000 a year, equivalent to a polytechnic, notwithstanding the recent pay award which has still to be implemented in the light of Mr Healey's proposals.

The freedom of discussion and inquiry in universities must be maintained. British universities are not closed institutions, pursue a lonely and isolated academic life, indifferent to their need for large sums of public money.

The natural links between universities and industry make the substantial body of knowledge and expertise which resides in the universities widely available. None of this seems to be realized by the CNA to the Government. It is almost as if the Government is intent on making universities bankrupt since the money they have taken away and will take away is committed money.

What we have to decide is how we can get the right balance between numbers and quality in universities.

Yet there is a problem. We face a period of financial stringency. If we restrict numbers, what do we do about those who are disappointed? Can we perhaps make more use of the university of the air for this purpose?

Is there not scope for more sharing of staff and facilities between universities and polytechnics? Perhaps we might even change of attitudes to the CNA to the independence of universities which could contribute to university life without costing the taxpayer a penny.

In the economic crisis which is now engulfing Britain the universities must make their share of sacrifices but it must not be more than a fair one.

Edited text of an address by Mr St John-Stewas, Opposition spokesman on education, to the National Association of Conservative Graduates.

David Tomley writes the second article in our series 'The Active Student'

Slides: a framework for learning

Knowledge is useless to a student until he makes it his own, and to do this he needs to be involved in some relevant activity which uses that knowledge. Lecturers who (principally) display their own (superior) skills as they (continually) dominate the proceedings tend to depress all but their most able students.

In fact, a student probably learns more and gains in satisfaction and confidence from solving a problem carefully posed to engage his or her intelligence than from listening to a lecturer's monologue. He does so by being more involved in the ordered thoughts of someone else.

Passive listening to explanations often results in a lessening of interest, but engaging students in activity in which they are taking the initiative can bring about greater involvement and better learning. One kind of resource material which can be used to support such an activity is 35mm slides.

Slides are cheap: they are a simple aspect of input, visual as opposed to verbal. But they do more than just convey a greater amount of information in a shorter time. They create a new framework within which learning can occur, moving beyond the idea of a single lecturer in a room with a large group of students.

As a stimulus to active participation by students, slides come into their own with small groups. They can be used to promote observation more easily as the group leader is able to question students. They are also invaluable tools for promoting discussion (for example, comparing and contrasting slides A and B, which perhaps show changes with time or changes in space), for asking for critical comment, for developing language skills, and even for changing attitudes.

Moreover, using slides with small groups can help in developing students' intellectual skills. They may become aware of errors in their thinking and find they need to reassess or rearrange their knowledge. They will increase their criticism from their peers, come to take account of other people's views and learn through discussion with each other, with a resulting change in their own views and attitudes.

Used in conjunction with tape sequences, slides make a valuable contribution to audiovisual learning techniques. Audio tutorials are very useful for revision purposes, for learning new skills and as aids in practical classes.

Their use is increasing as modules, units and minicourses which emphasize individualized

learning. Class time can be saved, for example, when an audio tutorial is prepared on a topic instead of a lecture given on it. If they are freely available, they enable the students to choose when and where to use them and they can be used at his pace and as often as he wishes.

With large groups in a lecture slides give a focus for both the lecturer and students. They add an extra dimension to existing practice if they are used to illustrate, in formative, and relevant, and provided that the lecturer has an easily manageable setup.

They can provide stimulus and impact material, a change of activity—looking and listening instead of just listening; they can give the opportunity to view something it is impossible or inconvenient for the group to visit. They can also be used before educational visits or field trips to alert the students to aspects which the tutor particularly wants them to note.

Projecting slides of microscope preparations can ensure that students know what they are looking for in practical classes. Furthermore, a slide sequence can convey the particular emphasis that a lecturer wants and give the lecture a more personal flavour.

However, as the amount of knowledge increases, courses cannot simply be lengthened or more material condensed into the same time. A gap must be filled, and we must pose such questions as "What is the purpose of the course?" "What do I hope the students will get out of it at the end?"

I suggest that if one of the aims is to develop the intellectual skills of students, the use of 35mm slides may help. It is no use pretending that they can accomplish much on their own, but used sensitively and in conjunction with other methods they can help to achieve this aim.

The author lectures at the School of

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Frank N. Student—manager

Brainchild of a world-famous cybernetician and distinguished professor of biology, Frank Student is now destined to change the face of higher education in this country.

Designed to provide student material more predictable and more amenable to discipline than his human counterparts, and, above all, more readily switched from one course to another to meet the teaching needs of academic staff, Frank Student is assured of a welcome in all university and polytechnic departments whose courses are undersubscribed. And how much better to support this all-British product than to rely on filling gaps by importing students from overseas!

In the greatest secrecy, Frank Student has already completed a "dry run" on a short course at a famous centre for management studies. Although it has to be recorded that he failed the course—and I shall explain about this later—his "coming live" must be rated an outstanding success.

Only minor cosmetic alterations were needed to make him indistinguishable from other men on the middle management "take a wider and deeper view" as preparation for further responsibility. To help him meet the challenge of this intensive educational experience, Frank Student was loaded with a "special" management word pack, with appropriate frequency words like structure, goal-formation, orientate and, lastly, especially, lastly, reigning queen of the vocabulary. He was also pro-

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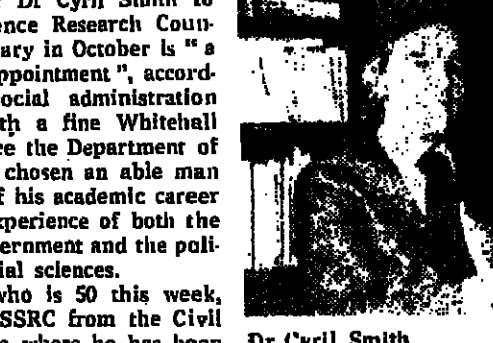
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Dr Cyril Smith

For some sociologists the key distinction is who decides what questions should be asked, not whether the questions are empirical or theoretical. The policy makers do not necessarily see all the problems, said one professor, who believed that Dr Smith would grasp every well-earned need to research from both inside and outside government.

But while Dr Smith's appointment has been enthusiastically received, there are doubts in some quarters. He is a sociologist, yet the ambit of the SSRC takes in many different social sciences. He is similar to the new SSRC chairman, Mr Derek Robinson, in that as an appointee of the Labour Government he could be the tool of a policy of screwing down the finalist factor on all research that is not useful and relevant to the Government's needs.

Fears are also, for example, about the SSRC's new research initiatives which are directed to scholarly sense. Dr Smith said he was aware of these fears. "We need a more conscious debate about the kind of research that we want to fund," he said.

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Eric Hewton discusses the Nuffield report, "Supporting Teaching for a Change"

How the art of seduction could improve university teaching

A lot of people these days are saying that teaching in universities is not what it should be. It should be improved to help the learner, say the educationalists (not themselves) for their teaching prowess. It should be improved, says the minister, to increase cost-effectiveness and thereby help the economy. It must be improved, say the students, because we know that it can be done better.

But what does improvement mean? Teaching is like the subtle art of seduction: motivation is the key. The battle is more than half won when the teacher has stimulated the learner to learn. Might it not be sensible to extend this notion to the improvement of teaching, and to ask of the academic what makes him want to learn more about teaching?

The Nuffield Group for Research and Innovation in Higher Education has attempted to tease out the answers to this question in a recent study of forms of support for teaching developments. The message in their report is clear. Efforts to improve teaching through the provision of media and consultancy services, through training or financial inducements, have disappointed expectations largely because they have not been understood by, or had the backing of those they were meant to help. The necessary motivation has been dubious, or impervious to, the value of what has been offered them.

Now television and audiovisual services have in the event been outstandingly successful. Optimistically, they claimed at first that they could improve teaching and reduce its cost. However, many participating teachers were disappointed: neither advantage was realized despite the extra work they had to put in.

Those responsible for running such services have begun to acknowledge the difficulties: and many of them now attempt to identify the real interests of the teacher by looking more closely at the day-to-day problems of teaching and learning. The results of this "client-centred" approach have on the whole been more promising.

Some universities have appointed special consultants to help with teaching and learning problems. They too have found it difficult to persuade academics of the need for their expertise. Educational technology has characteristically tended to offer ready-made solutions of a general kind, few of which are regarded by academics as relevant to their immediate concerns.

Without going through the intermediate stage of helping teachers to recognize and diagnose their particular difficulties, educational technology had little of practical value to offer. The consultants in their turn have now been obliged to seek common ground with academics.

The common ground is most appropriately (and in retrospect very obviously) "the course". Here consultants can be useful working with individuals or groups in a detailed and down-to-earth way on matters of course design, on difficulties arising from laboratory work or tutorials, or on problems of assessment or evaluation.

In general there have been some modest successes. But progress has been slow, and intermittent, and contact between teachers and these kinds of services has not been properly established. One fashionable view among some of those who have helped to offer it is that it is not sufficiently motivated to use the facilities available, some sort of reticence might help to "open their eyes". But this raises questions: who should be trained, when, by whom and how?

The provision of "induction courses" for new teachers is now widespread, but the courses tend to be too general and too remote from the realities of teaching; they usually appeal to only a small proportion of teachers. More recently workshops with an eye on the very high motivation to which student projects seem to give rise, "training" has tended to be conceived in more active and participating terms and has been organized through workshops rather than lectures and seminars.

Two or three terms, analysing problems associated with their own or each other's courses, and putting forward and developing possible solutions.

The working philosophy and assumptions of many departments reveal one major reason why the improvement of teaching is not generally regarded as important: academics are valued primarily in terms of their research. Criteria for tenure and promotion decisions usually make this clear.

Efforts have admittedly been made by a few institutions to reward outstanding contributions to teaching through promotion. However, it is one thing to legislate for this in an employment contract and quite another to operate a system which makes it work in practice. Many academics would doubt whether it is possible to assess originality and excellence in teaching.

The use of questionnaires—one of the methods often advocated—tends to alienate both teachers and students. There are other possibilities, but these have so far been given scant attention: for instance, notice could be taken of publications in educational journals; the development of course materials; participation in collaborative teaching projects, course teams or study visits; work on relevant working parties or committees; contributions to conferences on teaching topics; supervision of postgraduate work on educational themes; and appeals to external or internal referees.

Promotion—important as it may be—is not, of course, the only motivating factor for teachers. There is considerable reward to be had from enjoying one's job, knowing that one is doing it well, and knowing that one's efforts are valued by others. Yet at the moment, little seems to be done to increase the "job-satisfaction" of an academic's teaching activities.

The extra work which a teacher puts into the improvement of teaching is seldom properly recognized by his colleagues. Additional time and resources are rarely made available, and the teacher who persists despite the general apathy is often seen as an embarrassment rather than an asset to his department.

Why every academic should be expected to give his time to research, administration and teaching, usually in that order, remains a puzzle. In most activities, other than education, there is some specialization, according to interests and expertise, is encouraged, especially if it contributes to the needs of the organization. Yet those academics who have decided to give more attention to their teaching than their research freely admit that they have taken a "big career risk".

Only a small minority of universities go so far as to devise planning and budgeting systems which directly promote attention to teaching by departments and cater for the special needs of new developments. The formula on which the annual allocation of funds is based is usually historically derived: departmental chairmen are seldom called upon to justify their requirements. There is little incentive or opportunity for them to argue for additional resources or alternative kinds of funding to permit developments in teaching.

Moreover, the planning system is seldom understood by academics, only a limited number of whom take part in the detailed negotiations that provide the framework for running undergraduate courses. In the few institutions which depart from this stereotype, the debate over departmental allocations is more wide-ranging; the planning and budgeting procedures are designed to direct discussion towards teaching needs and the necessary adjustments are made in the resources required to support different types of course.

Two or three other universities have sought to bring about improvements in teaching by creating a "teaching development fund", in which the aim is to provide small additional amounts of money to enable individual teachers or departments to launch innovative developments.

blems: the motivation of teachers and departments, and the provision of the right facilities. Whatever means are actually used to tackle both, one thing is clear. Unless the academic community as a whole wants to improve teaching, by and large teaching will not be improved. Isolated units or committees will not get far. Furthermore, the use of media, consultancy support, training, rewards, and the allocation of resources are all closely interconnected. The present links between them are tenuous indeed, and urgently need to be strengthened.

How can this closer articulation be brought about? Even if there is no single ideal solution, it would seem sensible that overall responsibility for educational development should be placed with a group which has the full backing of the senate, and thus symbolizes the degree of importance attached to teaching and learning by the institution as a whole.

A committee of senate might be created with explicit responsibilities for deciding policy about staff development; stimulating and reviewing departmental plans for teacher assessment and reward; working on university-wide schemes for teaching improvements; and coordinating the various centres, units and services concerned with helping teachers.

Alternatively, or in addition, a senior academic might be given specific responsibility for promoting new thinking about teaching and learning in the university; and be enabled to provide earmarked resources to stimulate curriculum development, and to encourage innovative and experimental courses.

Nor would it seem unreasonable to propose that formal periodic reviews of teaching activities should become a normal part of university life. This sort of review conducted by groups within schools or departments could include questions about basic aims and the quality of teaching provision. The outcome could become an integral part of the university's planning process and could contribute towards the negotiation of budgetary allocations.

Such reviews might encourage schools and departments to accept greater responsibility for the development of their own teaching; and the onus which now falls upon them for probationary supervision and training should act as a further stimulus.

Students, too, can provide a powerful force for the improvement of courses. They are the consumers, and those departments which have seriously consulted them have not been disappointed.

liaison between the departments and central units can be effectively strengthened by short period exchanges of staff, as a number of universities have demonstrated. This is one step on the road to creating opportunities for a campus-wide exchange of ideas and experience on teaching issues, of a kind for which there is at present little provision or encouragement.

Finally, at a time when economic cutbacks have led to a drastic decline in staff mobility, there is a stronger case than ever before for universities to look outward, rather than inward, for opportunities to encourage better teaching. The sharing of resources and expertise, including regular visits, the exchange of teaching staff, joint teaching or training programmes, or cooperative curriculum design projects are all possibilities which deserve active exploration.

But in the long term, there is no escape from the bald conclusion that teaching in universities can improve only in direct ratio to their full-hearted recognition that teaching is as important as research. On the road to that recognition they have still a long way to go.

These ideas, arguments and recommendations are developed in greater detail in a report, "Supporting Teaching for a Change: a study of forms of support for teaching in universities", by the Nuffield Group for Research and Innovation in Higher Education. The report, which is based on a review of various types of provision in 16 different institutions, will be available from the Nuffield Foundation (price 50p) in July.

The author is a member of the Nuffield Group.

Decisive newts point to a formula that predicts human behaviour

Conventional ideas of how animals—including man—make decisions may have to be revised drastically if new findings by the Animal Behaviour Research Group at Oxford University prove correct.

Their research is at present confined to decision-making in newts, sticklebacks, great tits and herring gulls, but Dr D. J. McFarland, who directs the group, believes that eventually their results will be applied to man—and might have powerful consequences where financial decisions are concerned.

Research on human decision-making is a growth point but it is chiefly carried out by economists and social scientists; Dr McFarland claims the social science approach begins with the assumption that man behaves as a rational economic being. He says: "We are not yet prepared to believe that man has yet gone all the way in the process of evolution."

The Animal Behaviour Research Group is very new. It was established last October through the fusion of two research teams. Dr McFarland's experimental psychologists—an interdisciplinary team of zoologists, mathematicians and psychologists—and the animal behaviour group of the eminent ethologist Professor Nikolaas Tinbergen. Professor Tinbergen received a room in the department and continues with his work on adaptive radiation.

The new group has only three established staff. Dr McFarland and Dr Richard Dawkins and Dr Marian Dawkins, but there are some 30 research fellows, research students and research assistants in the team. It has already built up a high reputation: John Krebs, son of Sir Hans Krebs, the distinguished biochemist, gave up a tenured post in the University of Wales to work as a research fellow on bird song and foraging behaviour with the group.

Like all research groups in Oxford, the team is suffering from lack of finance. Dr McFarland says it would be doing twice as much work, especially overseas, if funds were available, but the existing programmes are supported by the Science Research Council, the Medical Research Council and the Natural Environment Research Council.

The Oxford group is, on the theoretical side, essentially concerned with a systems approach to decision making in animals, as Dr McFarland put it: "Discovering how animals are designed by nature to spend their time in the most useful way—or if you object to the word 'fitness'—maximizing Darwinian fitness. It is a multi-disciplinary study involving zoologists, laboratory experimentalists and mathematicians."

Animals make decisions chiefly about the use of resources, according to Dr McFarland, and they do these rules could be uncovered and understood, the conclusions might be of use to man.

He argues, for example, that much decision making is based in the design of an animal rather than

in a process requiring intelligence. If this is accepted it should be possible to derive a mathematical expression which could be used to predict animal behaviour given any fixed set of circumstances. This would apply to man as well as other forms of life.

Dr McFarland says his group has now produced an early version of such formulae and the results will be published shortly in the international ecological journal *American Naturalist*.

He explains that most animal decisions are based on a form of cost-benefit analysis; the animal undertakes the kind of behaviour which gives it the most benefit for the least input of energy. Such behaviour is a design feature resulting from the animal's evolutionary history, rather than a cognitive development.

One early result of Dr McFarland's work is the finding that decision-making is not a competitive process but a time-shared process. Conventionally, animals have been expected to make decisions to undertake various activities—feeding, establishing territorial boundaries, mating—according to competing instincts. When the urge to mate becomes stronger than the urge to feed, the animal will indulge in sexual behaviour and vice versa.

According to Dr McFarland at any one time there may be a single major behavioural directive—say, nest building and maintenance, but during the same time other activities must be performed: courting or foraging for food.

Time for these activities is shared with time taken for the major activity in rather the same way that a large computer system shares out real time between all the various tasks assigned to it. The animal, however, allows a very specific amount of time for these subsidiary tasks. If prevented from carrying them out it will return to the main task as though it had actually performed its subsidiary duty.

Dr McFarland illustrates this by considering a lecturer who inevitably spends five minutes telling a joke during his lecture. If prevented from telling his joke by some mishap which fills the whole five minutes, he will not take time later on to tell it.

There are probably no other groups in the world carrying out research exactly like the Oxford team and in fact few groups have access to the kind of field conditions with which they are favoured—there is, for example, the herring gull colony to which Professor Tinbergen devoted 20 years of research.

Dr McFarland is clearly excited about the possibilities in his work although he remains modest about their immediate applicability to human problems. "Nobody is going to pick this up and take it to the United Nations and say: 'If we use this formula everything is going to be all right.'"

Nevertheless, his data is already sufficiently impressive to suggest that economic analysts could well improve their predictions using a little basic biological knowledge.

Alan Cane

Guy Neave discusses the implications of a 'manpower-planning' approach to higher education

No instant cures in the new dogma

It was customary in France of the seventeenth century to be clapped heretics whether they preferred prison, mines or "noisome galleys" as price of their continued obduracy. However bizarre the penalties, they were meted out in the belief that, if they did not secure salvation for the clapped and the damned, they nevertheless had the inestimable advantage of eliminating heresy and securing the stability of the state.

Much of today's debate on higher education could be illustrated in similar terms. Indeed higher education seems to share the exquisite dilemma of thinking itself orthodox but being accused of heresy. Aides to achieving anything significant is something of a double-edged sword. Such behaviour is a design feature of "manpower-planning"—positive or otherwise—as enunciated in the Gospel according to Lord Crowther Hunt.

Now one indispensable condition of setting up a novel creed, especially if you want to convert the old believers to seeing the error of their ways, is that you have, first, the apparatus to do it; and, second, that you are clear about the finer points and repercussions of the new dogma and doctrine.

Nobody expects the Spanish Inquisition to be bereft of its Jesuits. But having had the first taste of forcible conversion to the new dogma of "national manpower-planning", this seems to be precisely the situation that is emerging.

Like most radical reforms, the notion of "positive" manpower-planning in higher education as the keystone of the Government's future policy remains obscure, both as regards its assumptions and its repercussions in the higher and the secondary sector. Or if not obscure, then at least coy about what is required.

It is one thing to suggest, as the Minister of State did in his Scarborough speech in May, that we need to do what we can to guide the young people when they make their future career decisions

higher education is that while it might have the first, it does not have the second. As exercised, our curriculum and subject choice patterns in school are highly predictable, and decisions are taken far, far too early.

The future scientist specializing at 14 years of age is scarcely credible even outside a caste system. In short, adaptability (and even, as my own researches have shown, student wishes) has been sacrificed to predictability.

On the other hand, if we go to the other extreme and place the emphasis upon flexibility alone, then predicting future demand and the areas it is likely to fall, becomes a yet more hazardous exercise, even within the limited confines of the present 15 per cent of the age group entering higher education.

The only way to meet both sides of the "manpower-planning" equation is by creating a common or compulsory core course right up to post-secondary education. Effectively it is only under such a prior condition that school leavers, at any level, will best be able to match their talents to the nation's needs, that is, by keeping their options open across the arts/science divide.

Attempts to build a "generalist" approach to the education of 16 to 18-year-olds have of course, permeated the myriad proposals for curriculum reform that littered the working papers of the Schools Council like heaps of the slain in the aftermath of battle. The question is whether we can afford to continue an early specialization, whose origins are to be found in the classics curriculum of the public schools in the late nineteenth century.

It is possible that planning for the "positive manpower approach" envisages none of these proposals. What would be the consequences for secondary and higher education? And how indispensable is a core secondary school curriculum to the whole reform?

It will also have to re-educate or, alternatively, "de-specialize" school leavers. Post-secondary education will have an additional task of assuming the full burden of educational and economic change, and undoing the distortions in the secondary sector that impede "flexibility".

Bringing a critical approach to science into the polytechnics

Michael Worboys discusses the growth of 'science and society' courses in polytechnics, and some of the problems that have been encountered

Most science and engineering courses in polytechnics have, in recent years, come to include "science and society" and "technology and society" courses as part of their curriculum, almost all of which have developed from "general studies" programmes.

The major problems now facing teachers of social studies of science and technology, not only in polytechnics, but also in universities and colleges of technology, are to break away from the "general studies" concept and context, and to have this new area of study recognized in its own right. To have social studies of science and technology become an integral part of science and engineering curricula.

The supposed dichotomy between "liberal education" and "technical education" has been a live issue in Britain for over a century. Technical education has always been seen by its critics to be lacking a "liberal" or "humanist" element.

What this had come to mean in the late 1950s was crystallized in the Ministry of Education Circular 323 (1957), entitled *Liberal Education in Technical Colleges*. This suggested that all students taking science and technology in non-university sectors of higher education should take some form of non-vocational study to encourage the development of a broad outlook and a sense of spiritual and human values.

These objectives were usually met by courses run by a liberal studies department which serviced all the courses of a college. To counteract

put on courses that tended to be wide-ranging and eclectic, aiming to "civilize" and "mould" the whole person.

Despite general agreement on the desirability and potential value of including a broadening element in technical education, its practice began to—and in many cases still does—encounter adverse reaction. Being both unrelated and subordinate to the students' main courses of study, it was considered by both student and teacher alike to be irrelevant.

Liberal studies teaching assumed the existence of certain deficiencies in conventional technical education, but it sought only to compensate for these, not as would seem more appropriate to articulate and make students aware of the perceived deficiencies.

For most, the deficiencies were and still are associated with narrow specialization. That is, the failure to teach more than the technical aspects of a subject, the failure to look at the limitations and social implications of these subjects, the failure to prepare students for their role in social life, and the failure to see science and technology generally in a social context.

Over the years many liberal studies teachers, especially those specializing in service work to science faculties and those who were former scientists and engineers, realized these failures and began to develop teaching in social studies of science and technology.

Initially they were not helped by the guidelines on liberal studies in the 1950s, which stated that all courses should be designed to satisfy the following limited educational aims: to make the student aware of the limitations of his disciplines and their methods and to provide opportunities for him to understand, make, and criticize value judgments as a humanist, the history and culture of the subject, and the significance of science, technology, economics and sociological factors in modern society.

Many people have interpreted this part of the CNAA regulations, reaffirmed in June 1974, to be a direct call for teaching in social

ing courses. Indeed, a few polytechnics, often those where arts and social science courses were slow to develop, have made substantial curricular innovations in this direction: for example, the "science and society" group at Newcastle-upon-Tyne and the "modern sciences" group at North-East London.

However, in most polytechnics an intractable battle is still being fought to have social studies of science and technology accepted as an important part of science and engineering curricula.

Problems arise because the force for change is coming from outside the science and engineering departments themselves, in other words from a previously subordinate subject area. Furthermore, any change or broadening of established subjects encounters the problem that not only do these moves attempt to redefine what counts as a science and engineering education, but ultimately they challenge the hegemony of conventional disciplines and hence of professional interests.

The actual content of social studies of science and technology teaching in polytechnics has responded to a number of forces and objectives, and these are reflected in five conceptions of the subject.

On many courses social studies of science and technology are taught as a humanist, the history and cultural role of science and technology being emphasized. This conception is closest to the old liberal studies concept and bears many of its deficiencies, although in a number of instances this conception is successfully taught on arts and social science courses.

In other conceptions a more explicit relationship to science and engineering courses has been sought. A number of courses stress the notion of social responsibility, that is, of drawing out the social implications of the scientific and technological factors in modern society.

The Council of Engineering Institutions regulations for the "engineer in society" course embody this conception, although in practice this course often tends

to have formal acquaintance with "verbal" processes and industrial skills to make them more effective agents in a technological society, and perhaps to widen their employment horizons and prospects.

In some situations, especially where historians of science, historians of technology and philosophers of science were employed by former liberal studies departments, it is not unusual to find an academic conception of social studies of science and technology, directly modelled on professionalized academic disciplines like history and philosophy of science.

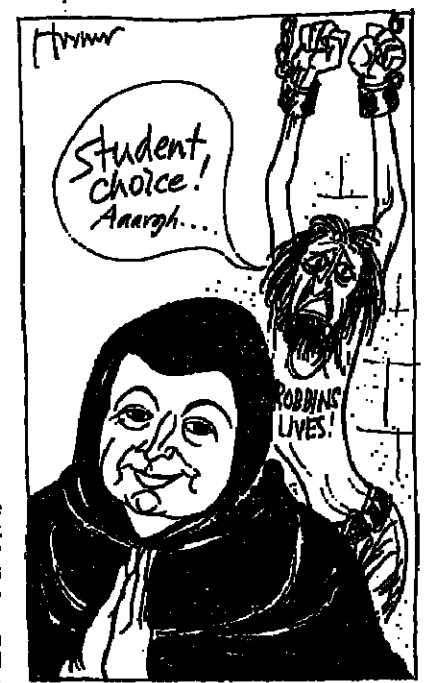
In each of the above cases, social studies of science and technology are seen as an addition to the conventional curriculum, which will supplement and extend its content. Most broader science and engineering courses are developing in this way, often as a response to declining student numbers.

The final conceptual attempt to go beyond those discussed above by making social studies of science and technology an integral and reflexive part of the course. This conception not only seeks to inform students of different interpretations of science and technology and their social relations, but also seeks to relate these perspectives to the future development of technical education, and the social roles of scientists and engineers.

Social studies of science and technology are well represented in polytechnics, and could be destined to play an important part in the future development of polytechnic education. It would seem that teaching and research in this area is particularly appropriate to the distinctive type of education polytechnics endeavour to provide.

Furthermore, given the polytechnic's special concern with the inter-relationship between science, technology, industry and society, social studies of science and technology could fulfil a central mediating role with respect to these wider social interests.

The author is a research fellow in the Centre for Educational Sociology at Edinburgh University.



American news

An escape from male pressures

from Angela Srent

CAMBRIDGE, MASS In the late 1960s, single-sex colleges, for both financial and social reasons, were caught up in a coeducational race. As more traditional alumni boomed the decline of old-fashioned education, many universities changed their statutes to admit students of the opposite sex. Yet hardly was the coeducation boom in full swing than the women's movement reasserted the value of all-female colleges. As a result, women's colleges have experienced a revival in the last few years and the trend towards coeducation has been halted.

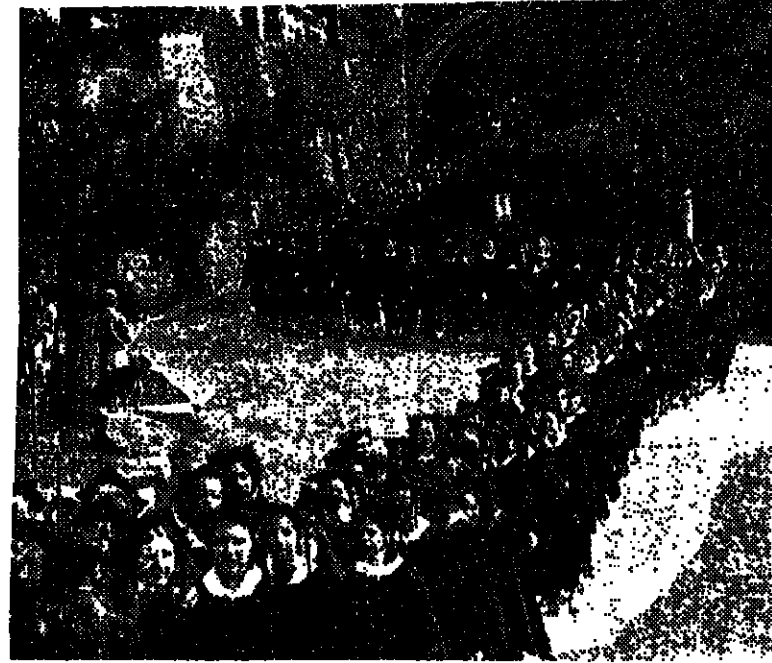
Many colleges made the decision to go coeducational before the full brunt of the women's movement had been felt. Because it took a few years to organize the changeover, some campuses have begun to function coeducationally only in the last couple of years when the idea already seemed passé.

Vassar College, one of the most famous women's colleges, whose alumni include Mrs Jacqueline Kennedy Onassis, has encountered some unanticipated problems since it began to admit men. One of its main difficulties has been recruiting enough men of high academic quality. It had originally planned to increase its enrolment from 1,550 women to 2,400 students evenly divided between men and women. However, current enrolment figures are 2,200 students, of which less than one third are males.

The men's colleges that decided to admit women have been doing better than the all-female colleges that have gone coeducational. Dartmouth College, which began to admit women two years ago, has managed to increase its student body while keeping its male/female ratio at 10:1. Princeton went coeducational four years ago and experienced relatively few problems, with a current male/female ratio of 2.5:1.

Yale University, which began to take women in 1969, admitted its first "ex-blind" class this year. Harvard, which has always had Radcliffe College as its female counterpart, has just approved a plan to merge the admissions offices of Harvard and Radcliffe and institute a coeducational admissions policy starting in 1976. Harvard currently has 4,568 male students and Radcliffe has 1,719, but the plan does not envisage an increase in the overall size of the university.

Contrary to predictions of a few years ago, many women's colleges have decided not to admit men. There are 135 women's colleges in the US, and in a recent survey conducted by the National Council of Independent Colleges and Universities, 43 per cent of those surveyed reported an increase in freshmen enrolment.



Wellesley College: new focus for women's rights.

Wellesley College and Universities, 43 per cent of those surveyed reported an increase in freshmen enrolment.

Women's colleges have managed to reverse the trend against them by modernizing their curriculum and attracting a different calibre of student. Many colleges have begun to stress the career-training component of their programmes and have de-emphasized the liberal arts elements of the traditional "female academies" whose main task was to prepare gracious wives for successful husbands. Now, female colleges are preparing women to compete with men in such fields as business, science, engineering and communications.

These moves have recently been reinforced by a five-year study of women defined as "career successful" by virtue of their inclusion in "Who's Who in American Women". Professor Elizabeth Tidball, of George Washington University, conducted the study and her findings show that graduates of women's colleges are more than twice as likely as their counterparts in coeducational institutions to be "career successful".

This study is one of the many pieces of evidence which Mrs Barbara Newell, an economist who became president of Wellesley College in 1972, uses to argue her case for the importance of women's colleges. "One of the products of the last decade," she explains, "was the awareness of women of their own needs and concerns as individuals. An institution which specializes in the education of women draws the support of these women."

In 1971, however, virtually the entire faculty of Wellesley favoured coeducation. They based their arguments on the inevitability that the female graduate would have to compete in the male world. The trustees of Wellesley disagreed, and they voted to retain Wellesley as a female college. They were supported by one of the final reports of the Carnegie Commission, which called Wellesley, Smith and Mount Holyoke, all single-sex institutions, a "national resource".

Under Mrs Newell's leadership, applications have risen by 18 per cent and Wellesley is gaining a reputation as a college which prepares women for professional careers exceptionally well. For instance, Harvard Business School accepts more women from Wellesley than from any other single institution, and economics, normally an unpopular field for women, has an unusually large enrolment.

Mrs Newell, a vocal advocate of women's rights in the academic world, has established a research centre at Wellesley which, when completed, is designed to be a world-wide centre for women's concerns, focusing on the socialization of women and their changing roles.

America's largest women's college, Smith College, in Northampton, Massachusetts, typifies the advantages of single-sex colleges in the current economic and social climate.

Applications are up 13 per cent and Smith has just completed a successful \$45m capital drive in which its alumnae do not seem to have been affected by the recession. Smith has recently been in the news because for the first time in its 100-year history it has chosen a woman president who assumed her duties on July 1.

Mrs Jill Conway, a historian, is an Australian whose career has encompassed sheep-farming in the outback, modelling in London and teaching history at Toronto University. She will have an operating budget of \$20m, plus an endowment with a market value of \$60m, which puts Smith in a more fortunate position than many other colleges. With some 2,500 undergraduates and a faculty of 240, Smith has recently been charged with discrimination in its hiring.

The Massachusetts Commission Against Discrimination has curiously charged that Smith discriminates against women in its hiring, after two women who were denied tenure instituted proceedings against the college. Whereas 51 per cent of the faculty were women in 1958 the figure was 32 per cent in 1972. Smith appealed against the ruling on the grounds that no outside agency should be able to interfere with its hiring policy, a move which Mrs Conway supports.

Smith College, according to Mrs Conway, must "change the perception of employers that women have certain kinds of skills and something must be done to make women realize what skills they have". She also believes that "everybody should be literate in computer science, statistics and information systems".

As many women's colleges revise their curricula, they are also beginning to attract a brand new pool of students: women beyond the normal college age who now want degrees that will equip them for the job market. This new approach, common in smaller colleges, is also attracting more business recruiters than before, as firms scramble to fill more management positions with women so as to satisfy federal equal hiring and equal promotion requirements. This has boosted the financial fortunes of many less venerable colleges.

While women's students at female colleges ply their sisters in coeducational institutions they reaffirm their preference for an environment free of male pressures. Said one Mount Holyoke student, "Here you have the opportunity to be the class president or editor of the paper. There are no males to compete with you, so you're more likely to become involved."

CIA 'read all papers it could find'

from Frances Hill

NEW YORK In the course of their investigation of "disident" elements in American society, CIA agents in the Office of Security read "all" college papers the branch could get and had time to read," according to the Rockefeller Commission's report on domestic activities of the Central Intelligence Agency.

The CIA Office of Security began its investigation of "disident activity" in December 1967 with the stated purpose of identifying threats to CIA personnel, projects and installations and determining whether there was any foreign sponsorship behind "disident groups". Agents gained information from "willing sources", newspapers and other publications, including college papers.

Between 1967 and 1973 the office assembled between 500 and 800 files on "disident organizations" and "individuals related in various ways to disident activity". About 12,000 and 16,000 individual names were included in these two files.



Rockefeller: probing CIA.

The commission's report does not state how many of the "disident groups" or individuals investigated by the CIA were connected with universities and colleges. But files were kept on two university professors "publicly involved in copying CIA contract projects at about 20 universities". Field offices made contacts with university and college officials "to determine the general level of disident activity on campus—and the nature and extent of activity directed against the CIA in particular".

Information gained from university officials was used to inform CIA agents planning to visit particular campuses for recruitment purposes, whether they were likely to encounter difficulties. "If a recruiter was to visit a campus where there were indications of trouble, the Office of Security would inform him with monitoring and communications support."

It trouble arose while the recruiting interviews were in progress, "appropriate warnings were communicated to the recruiter, the enforcement agencies in the vicinity were alerted, and arrangements were made for terminating the interview and leaving the campus." If the recruiter elected not to conduct interviews on a college or university campus the Office of Security would arrange for alternative interviewing space in off-campus facilities, if possible.

"Where necessary, similar monitoring and communications support was provided at the off-campus sites. In some instances the campus atmosphere was so hostile that scheduled recruitment visits were simply cancelled."

The programme of assistance to recruiters was discontinued in 1970 by which time "revision in the agency recruitment programme"

Paraguay

The Church sets the pace

from Patrick Knight

ASUNCION The two universities of Paraguay, the National and the Catholic, are complementary although they maintain a discreet distance from one another. The state-run National University, where about 8,000 students are enrolled, tends to be restricted by the severe political censor regime, while the Catholic University, only 15 years old, sets the pace in action and ideas. It is regarded with considerable suspicion by the government, which has been in confrontation with the Church over several important issues for many years.

Neither university is really complete. The National is alone in offering courses in the exact sciences, with medicine, civil engineering, chemistry and pharmacy, agronomy and veterinary science among those available. Entry to these faculties is severely restricted, however, and only about half the applicants get places. As a result, 45 per cent of the students of the National are forced to attend courses in only three faculties: those of law, humanities and philosophy, where entrance is much easier, while all the 4,000 students at the Catholic University are in these disciplines. These subjects are taught in the evenings alone at both institutions.

There is considerable pressure on the National University at the moment to expand the number of places available in the technical and scientific disciplines, and there is as yet no other institution in the country where those who have completed secondary education can get any sort of training.

Those who complete secondary education are still only a tiny proportion of pupils. Only 26 per cent of those who start primary school at the age of seven or eight finish the six year course, though numbers are growing fast, and have doubled in recent years. In 1962, for example, only 12 per cent of primary school starters finished the cycle.

What students can aspire to at the universities is still very limited. Only civil engineering is offered, no mechanical, electrical or electronic courses being available, despite the fact that, within a decade, Paraguay will be one of the largest producers of hydro-electric power in the world. This is the first year that agronomy has been an independent faculty—until now it has been a subsidiary of veterinary science. Each of these two faculties will accept about 75 students this year.

Despite its lack of funds (the church in Paraguay is one of the poorest in Latin America and is not an important landowner) the Catholic University has been one of the country's dynamic institutions in the planning work has been given as much publicity as possible, with many public sessions, in an attempt to focus public opinion on the problems, and stir the authorities to taking some action.

Entirely dependent for finance on student fees, now some £50 a year, the university is not in a position to extend far from liberal studies. It would like to obtain extra funds from the government, but remains fearful of the price in a reduction of freedom of action it might be forced to pay as a result.

Except for mathematics and Spanish, where fairly simple selective tests have to be taken, the Catholic University does not have entrance examinations. All students share a common foundation year, during which there is a process of selection, and by the end of which between 30 and 40 per cent of entrants have dropped out. About 30 per cent of the intake finally graduate. Some 350 of the 4,000 students have their fees fully or partially paid by the Catholic University which now runs subsidiary centres in three small Paraguayan cities, Concepcion, Encarnacion and Villarrica, as well as Asuncion. The National University is concentrated in the capital.

The intake of students to the competitive faculties, such as medicine and engineering is still very heavily weighted in favour of pupils from the few private schools in Asuncion. Nine out of ten applicants from the best girls' school in the city were accepted for pharmacy in 1974, for example, whereas only two out of 20 applicants were accepted from schools in the interior.

There are no grants available only those with means can be full-time students, and thus attend the faculties of the exact sciences during the daytime. Large numbers study liberal subjects at the National or would prefer to be enrolled in exact sciences faculties. For this reason, many students go to Argentina, where access to courses is generally unlimited. The Brazilian government gives some grants each year, but the high cost of living and language problems in that country mean that the mass of independent students still travel to Argentina, most never to return.

There is already a considerable

Comecon

New institute will research in management

by I. V. Chak

Prime Ministers from the nine Comecon countries have decided to establish a Comecon Institute of Administration and Management, and have asked the Comecon Committee for Science and Technology to proceed with its organization. The main objectives of the institute will be to carry out research in the field of administration and management and to provide suitable and relevant administrative and managerial training for the increasing number of posts in Comecon organizations, standing committees, research centres, joint enterprises, and banks.

Students are released

JOHANNESBURG Seven Africans and Indians who were among a number of members of the Black South African Students Organization (Saso) and related organizations detained by the security police, were released from prison. The students, who had been held for part of the time, were released from prison. They were arrested at the end of September during a banned demonstration in support of the former Mozambique Frelimo guerrilla organisation, whose members have now

France

Shot in the arm for Pasteur Institute

from George Morgan

NICE A massive increase in State aid to the privately-owned Pasteur Institute in Paris has recently been decided by Madame Simone Weil, Minister of Health, after months of anxiety about the future of France's most prestigious medical research centre. For 1976, State funding will amount to over 48m francs (£5m), an increase of 25m francs. It is expected that the grant will be renewed in 1977.

In the short term, the increase in State funding should allow the institute to solve the problem of its chronic annual shortfall. Last year, the research centre announced a loss of £13m. By 1978 the accumulated debt was expected to reach £7m. In future years, increased production and more efficient management at Pasteur's industrial plant in Louviers should help to put the institute in the black for the first time in over a decade.

The new grant is said to be in payment for some of the services provided by Pasteur in the field of research, teaching and medical care. Among other features, the institute runs 11 documentation centres in France and abroad, and keeps a permanent stockpile of serum and vaccines for use in national epidemics. Research in the field which will benefit most from the increase. An additional £13m will bring the State contribution in this area to an annual £4m.

In addition, the government have

Malta education

An article on the reorganization of higher education in Malta (THE SUNDAY TIMES) wrongly stated that the women's college is owned by the Sisters of St. Joseph. It is in fact coming home for, and will enable many of them to acquire the postgraduate degrees necessary if they want to rise above the position of associate professor.

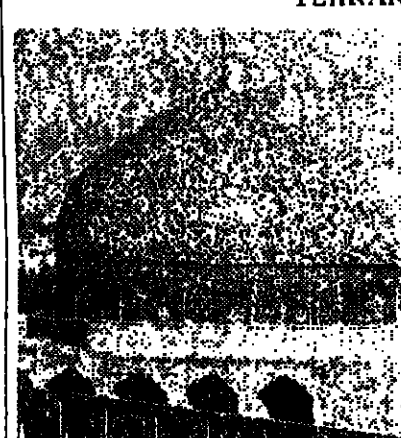
Another method is the Special University Scheme for postgraduates set up in 1972. Under this, the Iranian government offer scholarships to young academics to do their MSc or PhD abroad. They are paid the university salaries plus an extra allowance, and in return they are obliged to return and stay for at least twice the length of time of their postgraduate course. The British Council placed 40 of these postgraduates in Britain in the first year of the scheme and state that it is working well.

Finally, there is an increasing number of exchange agreements for staff and students between Iranian universities and those in Britain and America. Fahlav University at Shiraz, for example, has exchange programmes with the University of Pennsylvania, Kent State University and Massachusetts Institute of Technology, while Isfahan University has agreements with the Universities of Texas and Durham.

Not enough lecturers but too many students

from Annabel Ferriman

TEHRAN



Isfahan: the Shahk Lotfollah Mosque.

In many ways the problems of Iranian higher education are the exact opposite to those of Britain. Instead of too few young people wanting to become students, Iran has too many and instead of too many graduates looking for academic jobs Iran has too few.

Although the number of students in Iran has increased almost 200-fold over the past 40 years, from about 700 before the war to 135,000 now, demand for higher education far outstrips supply. For the 17,000 or so university admissions every autumn, there are about 150,000 applicants, making a 9:1 ratio of applicants to places, compared to the two to one ratio in Britain.

This has resulted in very high student/staff ratios and considerable pressure from the government on the universities to increase their intake. At Isfahan University, for example, in the modern languages department there is a 20:1 student/staff ratio among English majors and a 30:1 ratio among those taking English as a minor. The government have also insisted that the university admit students at the beginning of the spring semester as well as in the autumn, to double its intake.

To meet the high student demand and to produce much needed trained manpower, Iran has plans to increase its student numbers by 44 per cent over the next two years, from 135,000 to 196,000, largely by means of setting up seven new universities.

These will include the Free University of Iran, the approximate equivalent of Britain's Open University, and the Reza Shah Kibor University, the all-graduate English-medium research institute being set up at Mazandran on the Caspian Sea under the auspices of Harvard University.

Other universities are being established in Hamadan and Kermanshah in the north west, in Yazd in central Iran, Kerman in the south east and in Baluchistan on the Gulf of Oman. The government also intend to expand many of the existing universities, such as Shiraz which is to grow from 4,258 to 8,000.

The chief problem the government have to overcome in trying to achieve such rapid expansion is that of personnel. There is an acute shortage of suitably qualified and trained staff in the universities, due partly to the fact that the well-qualified Iranians tend to emigrate to the West.

Dr F. Safavi, the director of the centre for educational planning in the Ministry of Education and Planning in Science and Education, explained that up until recently the comparatively low pay in the universities has not attracted there were plenty of applicants for jobs because of the prestige. "But now that the country is undergoing a social upheaval and the private sector is enjoying a much prestige as the public sector there is little attraction in the job."

The problem of finding enough staff for the universities is being tackled by a variety of methods. The setting up of the all-graduate Reza Shah Kibor University is one way in which the government are trying to persuade

coming home for, and will enable many of them to acquire the postgraduate degrees necessary if they want to rise above the position of associate professor.

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The dramatic expansion in student numbers and university courses is not going to take place unimpeded. Manpower planning needs are going to be the first consideration. Thus technological and social studies courses are going to be expanded the most rapidly to try to provide the engineers, agricultural scientists, sociologists and anthropologists that the country needs.

Courses to train para-medical personnel are also sprouting up all over the country. Until now, Iran's medical training was very much modelled on Western lines, with the result that many students, once qualified, emigrate to the West. It has been estimated that while Iran has 11,000 doctors for its population of 32 million, there are about 8,000 Iranian doctors abroad—4,000 in America, 2,000 in West Germany and 2,000 in the rest of the world.

Fahlav University in Shiraz, because of its English-speaking faculty, has a particularly high emigration rate, with well over half the doctors it trains seeking employment abroad. To tackle this, the government have declared that any student who is prepared to stay in the country for twice the length of his course will have free tuition. However, they will have to pay the economic cost of his course. Since this is estimated at about £4,375 a year for medicine, it is likely to slow down the emigration rate dramatically.

On top of this, there is a drive to train para-medical personnel for the rural areas, which are acutely short of doctors at present. Courses for medical auxiliaries are to be offered on a large scale by the new College of Health Sciences on the outskirts of Tehran. This college, which took in its first class of about 100 last September, has a unique seven-year curriculum.

Students start with two years in science and the humanities. As time goes on they will branch off into various disciplines, starting with medical auxiliaries, (who only require three to six months of training, after which students will return to their villages to tend minor health problems and supervise public health activities) nurses, medical technicians, physicians' assistants and finally, for those who stay all seven years, fully-fledged doctors.

Another new university, which will be geared to providing medical personnel, is being set up in the north of Kerman. This university, which will open in September, is to incorporate a health college, providing four-year courses biased very much towards the practical side of medicine. The students will then go out to clinics in the rural areas for two years, before returning to the university for training and to provide much needed personnel. They could then return for two years to become fully qualified doctors.

Thus Iran's aim is both to expand education and adapt it more to the country's needs, and although university staff are now being recruited abroad and junior staff being sent to the West for their postgraduate work, it is obvious that Iran will more and more have to develop its own facilities for staff training with these staff in mind. The next few years in Iran should see a boom in



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The wisdom of waiting for a peaceful solution

It is now a virtual certainty that the University of London will not submit a private Bill to Parliament this autumn to enable it to carry out major constitutional reforms. The university's senate wisely voted last Wednesday for a moratorium to allow more time for the governing bodies of the schools and colleges to consult their members and make comments on the draft Bill.

The draft Bill at present being circulated would free the university from one important section of the University of London Act, 1926, enabling the university to change its constitution subject to the safeguard that senate must circulate a copy of any new statutes to the court, convocation and the governing bodies of the schools three months before making them and consider any representations made by these three bodies.

The major changes which the university is seeking to make, and which the present draft Bill would allow, are to make the vice-chancellor the full-time salaried academic and administrative head of the university with a possible eight-year term of office, with the principal responsible to him. At the moment the academic and administrative functions are separate.

Another change which the university has already made within its own powers has already given rise to grave misgivings in some quarters. This is the formation of the Joint Committee of the Court and Senate for collective planning (JCCP), a body of 16 people chaired by the vice-chancellor and including the principal, six heads of colleges and four senior academics. It is underpinned by a committee sub-structure designed to secure full academic and collegiate consideration of collective development proposals.

As defined by the university's second consultative report on the 1972 Murray report, the JCCP would have a pre-eminent role. Broadly speaking it would advise the court and senate on quinquennial submissions, academic priorities, new academic developments affecting other schools or involving major additional finance, and initiating, considering and co-ordinating proposals for rationalization and inter-collegiate cooperation within the university.

However, the terms of reference of the JCCP are now under review. At the last senate meeting it was accepted that the JCCP could operate as an advisory body and it was said that there was no intention it should have any executive powers. How the major colleges will react to whatever central planning unit emerges will depend very much on what powers that body is given.

The arguments advanced by some of the heads of the major colleges in favour of making the vice-chancellor the full-time academic and administrative head of the university, and for having a strong central planning unit, are clear. There is a need for continuity at the top of the federal structure, and the post of vice-chancellor should be occupied by an academic conscious of the implications of major academic decisions.

He should also be the administrative head, since, subject to the agreement of court and senate and the advice of the JCCP, he must make the major decisions on the allocation of resources and the quinquennial submissions to the University Grants Committee. It is

reasonable to expect a swift response to inquiries from the Department of Education and Science and the UGC.

They argue that the JCCP, far from increasing the power of the centre at the expense of the schools, will draw the schools and other bodies into the centre of decision-making, where they can make their pleas for grants, argue out major financial decisions affecting the whole university, and influence quinquennial submissions.

Yet if it is to work, the JCCP must be a genuine consultative body. It must not make speedy written decisions but should, as one head believes, tour the colleges, schools and other bodies and discuss the problems with them. Will it do so? For opponents of the constitutional reforms an ominous note was sounded by one paragraph of the university's second report. "Another practical problem for the JCCP arises from the fact that the university absorbs such a large proportion of the UGC's financial allocation to universities and that the UGC therefore requires from the university not only comprehensive but quick replies to many questions which arise in relation to forward planning in university education nationally. As a result, it has to be recognized that external constraints of this kind will sometimes impose limits on the breadth of consultation, however desirable it may be."

Opponents of the proposed changes argue that if the JCCP is to have a major role in the decision-making process, its role is far too great and will damage the autonomy of the schools where the teaching takes place and where academic decisions ought to be taken.

They also argue that the proposed changes have been encouraged by the DES and the UGC, and point not to Lord Crowther-Hunt's stated intention to limit postgraduate work, reduce staff-student ratios, promote certain disciplines at the expense of others and influence student choice, as well as the increasingly interventionist policy of the UGC and the DES.

The UGC, they say, has ceased to be a buffer between the universities and the DES, and is issuing clearer and stronger directives. It is required to make different and more important representations to the UGC, rather than simply a plea for a block grant, and if the UGC is to make heavier demands on the university, the power of a central planning unit, even strengthened by a central planning unit to resist these changes, will be severely limited.

They add that the UGC wants to be able to deal with a central body strong enough to control the schools, and that the schools will not be able to protect their institutions from the pressures exerted by the DES and the UGC.

More fundamentally, the argument is simply that the university might resist the strong demands made by the UGC and the DES. The belief, as Professor Ralf Dahrendorf, director of the London School of Economics, has said, that such pressures will damage the quality of university education.

Given these conflicting views, which were sharply brought into the open by the Privy Council's decision to disallow the university's proposed new statutes, the senate may well vote for a delay which will allow time for thought and discussion about the real aims of the university. There must be a great deal of misapprehension on the part of the ordinary university teacher about the nature of the proposed changes, and there is a serious and serious disquiet about them. A

LETTERS TO THE EDITOR

Academic publishing

from Mr John Rear

Sir,—Dr Ursula Henriques (*THE TIMES* July 11) suggests that the seriousness of the crisis in academic publishing is not appreciated by senior academic and administrators. I am sure this is generally true, although those few lecturers who attended the National Book League conference on books and under-graduates at the beginning of the month should now be in no doubt that the position is indeed serious.

However, the Society of Public Teachers of Law has for some time been aware of the possible implications for legal scholarship and education of the current economic situation and early last year the society established a working party, under the chairmanship of Professor William Twining of the University of Warwick, to investigate the situation.

The working party realised very early on that many of the problems with which it was concerned were not peculiar to law but were problems of concern to all academics. It was for this reason that it moved the NBL conference to ask its various sponsorship bodies to consider the establishment of an inquiry at the highest level into the problems of academic publishing and their implications for teaching and research in higher education.

The working party hopes that, among other issues, the inquiry would make a complete reappraisal of the prevailing principle that funding bodies, both private and public, sponsor research but not publication.

We are now in a situation in which the chances of the results of a research project being published to its appropriate audience are

greatly diminished. Many may feel that the purposes of sponsoring research will be defeated unless support is also given to enable the results to be published where those results are important.

In your leader (*THE TIMES* July 11) you suggest that the situation is "unfavourable" but not yet one of crisis. In fewer books published you see a "useful breathing space" for reappraisal of academics' attitudes towards the nature of course textbooks.

The evidence which this working party has been receiving suggests that your attitude may be slightly too complacent. The working party does not share the view that on the whole market pressures are a good indicator of academic worth and ability.

In the words of one leading publisher who gave evidence before us, the scholarly monograph has had it. And as to textbooks, all the evidence suggests that it is precisely the book which is in the growth areas, where the subject is important but the market small or which is innovative and which tries to explore the subject in a different way, that will go to the wall as the publishers retrench and put their available capital into books where they are quite certain a market exists and which is big enough to give them a rapid return on their investment.

Dr Henriques asks for a rescue operation. The SPIL working party hopes that as a start academics will support the call for the full inquiry which it has urged.

Yours faithfully,
JOHN REAR,
Secretary SPIL working party on law publishing,
University of Kent.

University reforms

from Professor John Fletcher

Sir,—What a delightful sense of fun Professor Hamerton displays in his letter (*THE TIMES* July 11). I am sure most of your readers will have noted with a touch of envy the unobtrusive but unmistakable proboscis of the tongue in his cheek in the best tradition of common room wit and banter. Indeed, college and departmental departments (foremost among these to be would be "as soon as convenient") will have savoured the spiciness of the professor's allusion in his opening sentence to Dean Swift's scarcely more provocative *Modest Proposals* for dealing with the Irish population explosion in the 18th century.

But why stop short at Hamerton's remedies for our current ills? Why not get rid of all but two departments of psychology, on the grounds that mental illness and mass unreason are on the increase despite the existence of so many experts in the subject? Or all but two departments of economics, on the grounds that the held simplicity of a weak flat owes nothing to the subtleties of econometrics? Or all but two departments of modern languages, on the grounds that their efforts do not appear to have advanced the growth of international understanding one little? Or all but two departments of physics (or biology, or chemistry), on the grounds that they are responsible, however indirectly, for the Atomic rifle, bacteriological weapons and so on?

Need I continue? As Swift knew only too well, some matters are too grave to jest about (and I do Professor Hamerton the courtesy of assuming he was joking) and readers who are not amused will instead to the constructive suggestions offered by Ivor Crewe in your same issue, and to Peter Conrad's much needed rebuttal of current nonsense about the "uselessness" of university subjects in the June *New Review*.

Yours faithfully,
JOHN FLETCHER,
Professor of comparative literature,
University of East Anglia.

from Dr John Radford
Sir,—*Modest proposals* remind us of Swift's, so that one is not entirely sure how serious Professor Hamerton is. Psychologists may feel inclined to restrict the teaching

A levels, these are a poor guide: this department has known cases of two A's later welcomed, with first-class honours degrees, into "serious" university departments.

I offer two further modest proposals, one more serious than the other (the reader may choose). First, let grants be given for one year at a time on the results of assessment each year. But let there be ample opportunity for part-time study, such that degrees can be obtained by a variety of routes. The present all-or-nothing system seems to me wasteful and inefficient.

Second, let us emulate the football league. Let departments be subject to relegation or promotion between divisions. (Departments, not institutions; each is too heterogeneous.) The binary system parallels the first-class/second-class system of cricket, for which current events at Edgbaston are no advertisement.

Further, let students be obtained by transfer. Large fees from industry for star graduates would ease the present crisis; and in turn part of these would find its way down to the least favoured schools.

With the advent of pools on students' performance, and "Exam of the Day" on Saturday night television, we might take education as seriously as we do sport.

Yours faithfully,
JOHN RADFORD,
Head of the psychology department,
North East London Polytechnic.

East Anglia students

from Mr Frank Albrighton

Sir,—It was something of a surprise for me to read (*THE TIMES* July 11) that a whole department at this university apparently had no students to teach in 1971-72, and even more of a surprise when I discovered that this department was agriculture and forestry.

UEA has no such school of studies, so who could this mysterious group be? Investigation has revealed that four were then members of the School of Social Studies (agricultural economists) and one was a member of the School of Environmental Sciences (a soil scientist). These people did in fact have many students to teach although the students have found their home in a different table of statistics. Yours faithfully,
FRANK ALBRIGHTON.

Closures

from Professor D. W. Barron

Sir,—The suggestions by Dr Robert Hunter and Mr Jo Grimond (*THE TIMES* July 18) that it might be necessary to close down some universities and/or polytechnics have aroused predictable reactions, but we should not dismiss their suggestions merely because they are unpalatable. It is better to "think the unthinkable" and explore the possible consequences of the present financial situation.

Dr Hunter is surely mistaken in asserting the *a priori* right to survival of "the great civic universities". They do some things very well, but I can think of subjects in which the reputation of Birmingham, say, is somewhat less than that of an upstart new university.

If it is the case that there is not sufficient money available to keep the universities going as they are at present set up, then rather than close some down would it not be better to consider some sort of rationalisation?

It seems to me that we should start by giving up the proposition that all universities should teach (almost) all subjects. In considering rationalisation, along these lines one would obviously look hard at departments that have consistently failed to attract a sufficient number of adequately qualified students.

However, it would be equally important to look closely at departments (particularly in science and engineering) that are too small to be viable in research. The commitment to research is the one distinguishing feature that sets universities apart from other forms of higher education, and in my own subject of computer science at least, it is clear that most of the worthwhile research comes from the larger groups.

Unlike Dr Hunter, I am not making these suggestions from a position of assured security. My own group is small, and would be a candidate for rationalisation. However, I would rather be out manning the lifeboats than back in the ballroom, listening to the band playing "Auld with Me" as the ship founders.

Yours sincerely,
D. W. BARRON,
Professor of computer studies,
Southampton University.

Loughborough

from Mr R. P. Bowson

Sir,—Recent developments and Governmental emphasis in the field of higher education have led to a curious situation, appearing at Loughborough which makes apparent some of the vagaries of these events.

The University of Loughborough maintains in its full title the use of "University of Technology" signifying its origins in its development from a college of advanced technology and the emphasis in the subjects taught within it.

It is proposing to amalgamate the local college of education into the university, financing of the whole being taken over by the UGC. Would it not be a better way to amalgamate the two to become a polytechnic?

This would enable the teaching staff at the university to be about doubled (5.8:1 staff ratio in polytechnics, 11:1 at Loughborough) for them to be better paid and with no restriction on the senior/junior staff ratio at present rigorously applied.

They would then be in a better position to pursue the type of research that distinguishes a university from other sectors of higher education.

Yours faithfully,
R. P. BOWSON,
President,
Loughborough AUT,
Loughborough University.

Showing students the horizons of experience

While the content of higher education must be closely related to students' professional needs, too narrow a concept of what is relevant to those will certainly prevent altogether the production of really adequate kinds of professional. Students in our time need to consider some of the consequences of the rapid growth of opportunities for control over other men which the advancement of human knowledge is bringing about—for example, through influencing the genes before birth; through the deliberate modification of human development by physical, psychological and sociological controls during childhood.

In the service of what concept, or "norm", of the good man or woman are such increasingly inevitable interferences to be exercised? We have clues to the norm and how it is to be sustained in, for example, the expression of man's mind in literature, music and art; the concepts of his potentialities which have been clarified or illuminated by philosophic and theological speculation; some of the scientific hunches and mathematical and medical discoveries of the past 200 years.

But to follow these clues requires in the student a developed sensitivity and imagination, some sense of history, a capacity to judge human nature which has been informed by experience gained interrelatedly from life and books—neither being enough by itself. It requires that he shall not be a specialist only, although unless he knows from experience what being a specialist means he may fail to reckon adequately both with what specialist advice can contribute and with what it cannot.

It also requires that he should be able to introspect, and in arriving at his final decision be able to estimate more or less rightly the relative importance of the factors, moral as well as physical, which are contributory to the evidence. Only in this way will he be able to counter the essential technological threat: that of going further and further ahead with little concern for the direction in which we are going.

'The first need is for a frequent realisation, in some humility, by both teacher and taught of their common limitations as human beings'

The first need is for a frequent realisation, in some humility, by both teacher and taught of their common limitations as human beings. One of the astonishing things about life for all of us is that we have to submit to happenings, sometimes of the greatest importance to us, without our being consulted at all.

Our birth—in what country or what century—was not of our choosing. We were never asked what sex we wanted to be. And all sorts of developments have their way with us without our being able to do much to stop them, or even make their onset faster or slower: the coming of adolescence, for example, or middle age or old age.

In spite of what all the advertisements say, we can control only a little how pretty or handsome or ugly we are. Birth and death, looks, illness, disablement, are all unasked for; neither wholly prophesiable nor fair. But some things we can do—and must do: keep in touch with life around us and keep up to date with ourselves.

These are primary conditions for fruitful experiencing. And without experience we can never become experienced or stay so. To sense, to love, to enter into things, all are conditions of understanding and conditions of being properly human; and there are no short cuts.

Most teachers in higher education need more humility than they have. "There are any number of attachments students could form", says Jon Roush, "and who am I to say that they should spend their time falling in love with Chaucer rather than Shakespeare or biophysics or dogs or one another? Such loves are mutually exclusive... to teach usually means to act like an inviolable expert whose task is to put his students through his paces. ... What right do I have to teach Chaucer? What right do I have to tell adults past the age of consent what they should know or who they should love? I refuse to accept the notion that I have the right because

An extract from "The Individual and the Social Future", one of a collection of essays *The Sciences, the Humanities and the Technological Threat* (ed. W. G. Niblett), recently published by the University of

Roy Niblett argues the need to retain a breadth of vision in higher education as a framework for the humane application of technological knowledge: 'We must keep in touch with life around us, and up to date with ourselves'

Chaucer is good or because I know more than my students, or because they will be grateful to me subsequently. If I want to work within a dialectical tradition, there seem to be only two conditions under which I have the right to teach anyone anything: when he asks me to, or when a community of which he is a member agrees that whatever I am teaching is something he should learn."

Such modesty is a good starting point. Secondly, it is important that students should come to recognize at least something of the significance of the past. Human life did not start in 1964 or even in 1954. Reading novels may help; so may dipping into the history of science; so may travel to other countries, or within one's own.

Also important, though, are exercises designed to help people to find again memories of what has been influential in the past of their own lives; such memories have a far wider range than education normally focuses upon or uses.

Men are often very out of touch with themselves. Scholars and scientists are fathers and mothers, too; maybe they are themselves interested in or concerned about music, or religion, or archaeology, or politics. Everyone knows, as his half-remembered dreams reveal, much more than he is normally able to recall.

Practice in recollective introspection—in the deliberate recollection in tranquillity of past experiences, some of them tinged with emotion—can be a deepening and unifying element in life. Such personal entering into one's own heritage can bind an existence together which otherwise appears made up simply of a miscellany of parts, each disparate and often superficial in meaning.

Much university study, perhaps inevitably, tends to have an opposite effect: to ensure that students are always observing, theorizing, deducing, calculating, anticipating consequences. Each of these is an important exercise, but if the concentration is wholly upon them the effect is to ensure that students postpone even the present moment instead of entering into it. They never indeed really enter into anything.

There is, of course, undeniably a need also for them to practise taking a detached, critical stance. It is necessary for them, however, to realize that neutrality is of no use as a permanent frame of mind. It is easy to deceive oneself into thinking that if one has observed a phenomenon with clean exactitude one really understands it and can explain it. But it is only in a very limited sense of the word that explanation is possible.

Birds winging their way west in the late summer may, as we look at their flight, evoke a feeling response in us. "They know not why they are flying on and on in the shape of an immense V". A more neutral response might be, "They are obeying a group-motivated, instinctive drive". Neither comment is really an explanation. Both may be correct, the one being a more internalized, emphatic response than the other.

What is important is that students should be able to exercise both frames of reference. They need to be able to accept their own feelings and thus "come into their own"; but also to be objectively observant. A curriculum that is to serve the future needs both elements firmly within it. It must use scientific and technological knowledge for a social future that will really be worth living in.

This is one of the justifications either for introducing into the curriculum some interdisciplinary studies or for enlarging the content of specialisms so that more attention is given to the social consequences of the subject one is studying. Students need to be jolted out of a pleased satisfaction with piecemeal, one-subject analyses and made to feel their limitations.

Interdisciplinary studies can sometimes build a bridge between conceptual knowledge and action in the world; sometimes they can fertilize specialisms afresh, making them big with a newly perceived relevance. Extreme specialization, as Leo Marx allows, may be an "effective way to train students for particular jobs, but, as he goes on to say, "it does very little to prepare them for winning the struggle for racial justice, or for stopping unjust wars, or for coping with

Inherent in many interdisciplinary, mission-oriented studies, no doubt, are assumptions about the direction in which society ought to develop and what "missions" are really important. There is a moral element concealed in some of them which we very clearly ought to make ourselves conscious, and of which there is no need to be ashamed.

Men may be building a civilization with a high floor of creature comforts, but if it has a low ceiling of aspiration they are trapped by it as much as if they were living at some earlier stage of history.

Many experiments in fashioning coherent curricula with interdisciplinary elements in them have been made in universities in the Western world during the past 100 years. Among the more notable, perhaps, have been those fashioned in the late 1930s at Chicago and Ann Arbor, in the 1950s at Keele and Antioch, in the 1960s at Sussex, Santa Cruz and Vincennes, and now in the 1970s at the Open University in Britain, at Evergreen College and the University of Wisconsin—Green Bay.

In many universities, however, and in some of these, the power of specialist departments understandably and rightly remains strong. But they have tended to suspect any mixing of disciplines which gives, or appears to give, them a reduced role. Nor have they seen it as appropriate for the university to perform a missionary task in society generally.

Our own period is marked by three phenomena which put a question mark in the minds of students as well as those of other people against this kind of conservatism.

First, it is becoming painfully obvious that man is using up the world's resources at a reckless pace. Hence his looking towards universities for responsible help in meeting a dilemma which is increasingly pressing. Such help requires interdepartmental cooperation, most notably at the postgraduate level, where centres of study can bring diverse disciplines into close and fruitful continuity.

Second, with the growth of student numbers and the emphasis placed on diversity and flexibility in course provision, binary systems of higher education have begun to emerge or, alternatively, some universities themselves are evolving so as to become more comprehensive in type.

In either of these cases a new impulse to curricular experiment is beginning to manifest itself. There is certainly a renewed recognition that the study of the curriculum, and curriculum theory, is of great importance—as important, indeed, as the study of the economics and structures of higher education were seen to be in the 1960s.

Then there were the dominant studies in the higher education field; there are now signs that the curriculum area will be the dominant study of the coming 10 years. In particular, there is shared concern that the programme followed by the individual during his higher education period should gain both in power to enrich him as a person and in social relevance.

'The study of the curriculum is now being seen as important as the study of the economics and structure of higher education was in the 1960s'

Third, there is increased questioning about where research, technical experimentation and intellectual analysis, left to themselves, may take us. Such questioning may lead, as we have seen, simply to forms of escapism: the forsaking of city life for hippy communities; the quest for religious that are reason-free; sensual indulgences that exalt the present moment over any possible social future at all.

But the significance of the sensate culture and of the dissatisfaction with too entire a concentration on intellectual analysis is not to be judged by such easy extremes. The criticism their voice comes from a deeper level.

Not long ago, Lord Ashby redefined the essence of research as "constant exploration at the limits of understanding." That is a brilliant provocation to a new and wider consideration of our need for it. Such a capacious view of its function could restore self-respect to the humanities and give a new legitimacy to reflectiveness, contemplation and insight, clarifying incidentally the import of scientific and technological research themselves.

There can be no social future which matters in human terms unless those through whom the currents of the present are passing allow them full yet selective flow. The importance of one value as compared with another goes unperceived save by the reflective, contemplative individual.

It is upon the education of individuals one by one—of their width of consciousness, sensitiveness of mind, their resolution in thinking, and in applying thought to action—that possibilities of a worthwhile future depend. It is a tough-and-gut business, no matter what the country to which our loyalties are given.

Sorting out the styles

not so huge, as historians have been led to suppose. The election of 1912 is shown to have been a crucial opportunity for Liberals to rally, but that they did not is seen by Dr Cook as the result of bad leadership at various levels. Yet it has to be said that in order to do so, Dr Cook's hero is obliged to enter the world of high politics where his authority is far more limited. The sources to which Dr Cook has relied are not suited to explorations in this area, and he is frequently driven back to an overworked diary (C. P. Scott's) for his illustrations. A preoccupation with data, moreover, precipitates some questionable judgments when the slide-rule has to be put away. It is all too easy to see "a anti-political storm" in the tenuous *Handmaid* and the local press.

What of the book's contribution to the ever-growing literature that seeks to analyse the decline and fall of the Liberal Party? Dr Cook does not see how a book like Dr Cook's can do more than monitor the process as opposed to demonstrating causality. If the critical element in the decline is taken to be the relationship between the Liberals and the Conservative Party, kind of history may open many doors. But there is a nagging feeling that electoral history, however consequence as much as cause, and that other relationship, such as that between Liberals and the Labour Party, are fundamental to an understanding of a political party and a doctrine now extinguished. Again, Dr Cook does not pretend that his conclusions extend themselves to any startling dramatic new theory. Rather, he provides a useful, readable, body of electoral fact which would enable theorists will need ultimately to

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USS

UNIVERSITIES
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SCHEME LTD

DEPUTY TO THE CHIEF EXECUTIVE OFFICER

Universities Superannuation Scheme Ltd is the Trustee Company which is responsible, at its office in Liverpool, for the operation of the new Superannuation Scheme for the academic staff of all UK Universities. The Scheme is compulsory for all new employees from April 1, 1975 and approximately 55,000 existing staff have an option to transfer to it over the five years up to 1980.

It is now proposed to appoint a senior person who will be involved in a variety of interesting aspects of pension scheme administration, including maintenance of records, calculation and payment of benefits, dealing with up to 750,000 individual life insurance policies and accounting requirements, and who will deputise for the Chief Executive Officer.

Applicants should have a degree and a professional qualification and wide experience of pension fund administration in a responsible position. A knowledge of computer data processing, life assurance, accounting or university administration would be an advantage. A salary of £7,000 is proposed for this appointment.

Applications should be sent to:

Mr. Sutrop MA FIA FICS, Chief Executive Officer
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Overseas

AUSTRALIA



THE VICTORIAN COLLEGE OF THE ARTS

The Victorian College of the Arts was established in Melbourne in 1973 as a College of Advanced Education to conduct courses at diploma and degree level for the Fine and Performing Arts. The Schools of Art and Music are already operating. A School of Drama will commence teaching in 1976 and a School of Dance is planned to open in 1977. A Junior School in music and dance is planned to open in 1978. The College is adjacent to and will operate in close liaison with the Victorian Arts Centre. The Director of the College is Mr. Lennox Parr.

DEAN - School of DANCE

DUTIES - To be responsible for the planning, conduct and development of the School. This will initially involve planning courses, advising on appointment of staff and plans for the building programme.

QUALIFICATIONS - Applicants should have achieved professional distinction in the field of dance and/or have experience in dance education. The appointee will be expected to take up duties in April 1976.

Appointments of teaching staff are to be made in the following areas -

School of MUSIC School of **DRAMA**

(Dean - John Hopkins)
Post 1950 Music
Orchestra, Ensemble & String Studies
Woodwind
Brass
Percussion

(Dean - Peter Oyston)
Technical Direction
Movement
Voice
Acting
Dramaturge/Research

Appointments may be made within the following categories depending on qualifications and experience -
Dean, School of Dance \$23,688
Principal Lecturer \$18,871
Senior Lecturer \$15,854 to \$18,544
Lecturer \$11,855 to \$15,844

The courses in the College are all in the performance aspects of the arts. Applicants will need to be experienced practising artists as well as teachers.

FURTHER INFORMATION - Details of the College, these positions and the form of application required are available on request to -
The Administrator, The Victorian College of the Arts,
234 St. Kilda Road, Melbourne, Victoria 3004, Australia.
All correspondence should be marked 'Confidential'.
Applications should be lodged by 30 August 1975.

ENGLISH LANGUAGE TEACHERS

The Petroleum Institute of Tripoli requires
English Language Teachers
with B.A. qualification in English and
teaching experience.

Please send applications to:

General Director,
Libyan Petroleum Institute,
P.O. Box 6184, Tripoli, Libya

Overseas continued

GIPPSLAND INSTITUTE OF
ADVANCED EDUCATION

1976 Staff Appointments

In addition to currently advertised academic staff appointments available in 1976, the Institute is planning for 1976 staff appointments and it is anticipated that a number of additional new positions will become available in the following areas at either Principal Lecturer, Senior Lecturer or Lecturer level. These will be advertised in due course.

SCHOOL OF BUSINESS AND SOCIAL SCIENCES

- Business Studies - (Economics, Accounting, Administrative Studies, Law, Farm Management)
- Sociology/Welfare Studies
- Literature
- Mathematics

SCHOOL OF EDUCATION

- Philosophical and Historical Foundations of Education
- Sociology of Education
- Educational Psychology
- Curriculum Studies (Primary, Mathematics, English, Creative Activities/Art, Music, Drama, Physical Education)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

- Physics - (Environmental Physics, Applied Physics)
- Biological Sciences

SCHOOL OF VISUAL ARTS

- Art History
- Graphic Design
- Printmaking
- Sculpture
- Ceramics
- Multi-media Studies

LIBRARY

Potential applicants for appointments in the above areas in 1976 are invited to make enquiries and register their interest with the Institute at this stage, and to submit a brief resume of personal particulars, qualifications and experience. The Institute will be pleased to provide preliminary information regarding the proposed staff appointments for 1976, and terms and conditions of employment.

Current academic salary scales are:
Principal Lecturer - \$A18,871 p.a.
Senior Lecturer - \$A15,854 p.a.
Lecturer - \$A11,855 to \$A15,844 p.a.

Enquiries should be addressed to:
The Registrar,
Gippsland Institute
of Advanced Education
P.O. Box 42, Churchill, Victoria, Australia, 3842.

General Vacancies



CAMBRIDGE UNIVERSITY PRESS

seeks an

Editor in Economics

The Press requires an editor in Cambridge to help maintain and develop profitably an important economics list from the undergraduate textbook level upwards. The successful candidate will take advice on manuscripts submitted, to see books through the press, and to assist the Publishing Director in the Social Sciences in the development and maintenance of the list. The post should appeal to a young graduate in economics wanting to make a career in publishing.

Experience in publishing, research or teaching an advantage. Preferred age-range 21-28; salary will be competitive, dependent on age and experience.

Candidates should apply, giving brief details of age, education, qualifications, career to date and present salary, to:

M. H. Black, Publisher,
CAMBRIDGE UNIVERSITY PRESS,
The Pitt Building, Trumpington Street,
Cambridge, CB2 1RP.

AUSTRALIA
Pahran College of Advanced Education

HEAD, Staff Development and Research Unit

Pahran College of Advanced Education is a public, post-secondary institution located in inner-suburban Melbourne, Australia.

DUTIES. To be responsible to the Director for the provision of pre-service and in-service education for 200 staff and for a programme of applied research on the College itself.

QUALIFICATIONS. A higher degree in education and experience in teacher-training and/or applied research, preferably at a tertiary level.

SALARY. Within the Senior Lecturer range, \$A15,954-\$A18,544.

Applications, containing details of personal and academic background, work experience and listing three referees, close on September 15, with the undersigned, from whom further details may be obtained.

L. T. Cullen, Registrar,
Pahran College of Advanced Education,
142 High Street,
Pahran Vic 3181 Australia.

General Vacancies

A job you'll enjoy

Many graduates find that the work they take up does not present them with the kind of intellectual challenge they seek, and to which they have become accustomed as students. This is unlikely to be a problem with the work of an Inspector of Taxes.

As an Inspector in charge of a Tax District you are responsible for the tax affairs of individuals and companies large and small in that area. You will deal personally with the more important cases, which will demand all your intellectual skills in reaching a fair and proper decision. In negotiation with a taxpayer's professional advisers you will need to exercise in full the intensive training in law and accountancy you receive. During your career you could take charge of the tax affairs of an entire district, enjoying wide powers of discretion. You may also spend periods on more specialised aspects of

taxation and acquire an enviable professional expertise—in itself a valuable career asset.

Qualifications: Under 32 and a degree with honours—at least second class honours ability. Final Year Students may apply.

If you start at 21, your salary should be over £4,200 at 23 and over £5,600 at 27. By your mid-30's you should be in a post taking you to over £8,000. By 40 you could be in a post with the Tax Inspectorate or in general management in the Civil Service, taking you to £11,000 p.a. There are vacancies all over the country; and salaries in the London area are up to £400 higher.

To find out more, and for an invitation to visit a Tax Inspector, write to Civil Service Commission, Alancon district, enjoying wide powers of discretion. You may also spend periods on more specialised aspects of

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MINISTRY OF DEFENCE
Burnham Lecturer Grade 1

IN THE
OVERSEAS ENGLISH WING, ARMY SCHOOL
OF LANGUAGES, BEACONSFIELD

Applications are invited from well-qualified teachers to fill this post as soon as possible.

DUTIES. Principally to teach English as a foreign language to a variety of service students from the Brigade of Gurkhas and from Commonwealth and Foreign Forces using course material for specific military purposes designed in the Army School of Languages. The teacher may be called upon to assist in the design and production of course material and audio-visual aids and to undertake escort duties for external visits to military displays and centres of interest. The teacher may also, if qualified, be called upon to assist in foreign language teaching to British service students. Teachers are also expected to take special interest in the welfare of students under their control.

QUALIFICATIONS. Teaching qualification and experience are essential. Preference will be given to applicants with qualification in the teaching of English as a Foreign Language. Knowledge of Modern language teaching techniques is essential.

SALARY. In accordance with the current scales for Teachers in Establishments for Further Education, i.e. £1,886-£3,633 p.a. plus threshold. A non-pensionable allowance of £468 p.a. will be paid for the slightly longer teaching year.

SUPERANNUATION. The appointment is superannuable under the Teachers' Superannuation Scheme.

APPLICATIONS. Requests for application forms and further details should be made to the

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